Fundamentals of Land Development
A Real-World Guide to Profitable Large-Scale Development

David E. Johnson, P.E., P.P.
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This textbook on the fundamentals of land development is based on the experience of the author. The concepts presented in this textbook have been used in planning, designing, and managing large-scale developments. The figures, illustrations, and photographs have been contributed by many industry professionals to assist in further defining land-development fundamentals.

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Dedicated to Karen, Sara, and Mark
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Preface

Future planning approaches to the development of land may not be unique or inspirational but must always be cost effective and marketable. New concepts in living environments are new forms of market-proven successes. The fragmentation of the building industry and the unwillingness of many entrepreneurs to invest time and financial resources into niche markets, specialty products, or innovative land plans will result in many standard housing approaches. This will further separate the housing markets, and the national builders share in the housing starts will continue to increase. Large-scale developments properly planned and visualized have been successfully constructed as master planned communities, planned unit developments, or new towns. This book will outline a systematic glance at all the various aspects of developing a successful and profitable large-scale project.

As the national builders gain in market share in even second tier markets, the outlook for continued growth of small- and medium size builders and developers will diminish. This prognostication is not the demise of small- to medium-size builders and developers but a chance for these companies to evaluate land in a different fashion. Large-scale developments will continue to foster the entrepreneurial spirit. Projects promoting sustained development approaches treat the use of land in a way that promotes and enhances the quality of life. Overall land-use planning for a project essentially absorbs the land through product and market segmentation. This planning methodology is available for those willing to create a vision by combining uses of land into a cohesive and fundamentally sound living environment.

Traditionally, local governments have regulated the way land is planned through zoning laws and master plans. Regulating where and the way people should live has been driven by planning principles promoting suburban developments. This is because land is less expensive outside the urban zones, and the building community will gravitate to land priced below the market while striving to increase density. What results are larger homes on smaller lots without linkage to services and commercial
cores to achieve sustainability. Urban centers promoting high densities will force development patterns toward existing services. This will not however eliminate the demand for a place to live and work outside of an urban environment.

New development patterns beyond urban cores must be embraced by local communities supporting the master planning of an area with diversification in housing segments, urban densities, and urban core values. The migration to outlying housing areas is a result of the home-buying public enhancing their quality of life while achieving housing affordability, but spending more time in long-distance commuting. Well-planned and -designed large-scale developments with market and housing segmentation, combined with visionary land-use and urban-core attributes will create a thriving point of destination. This large-scale planning approach cannot and will not be equaled by combining independent housing projects into a cohesive community environment.

Large-scale developments provide workable housing solutions only if the approach is supported by local government. This book addresses the practical approach of developing profitable large-scale developments. The reader may use this text as a guide in designing, obtaining entitlements, and constructing large-scale developments that meet the demands of their marketplace. Large-scale developments are not defined by area, density of development, or number of housing units but defined as property comprehensively planned with various land uses tied together with a vision of including living and working components into the plan.
Acknowledgments

The building industry has made significant strides in developing property sensitive to land form and site constraints while meeting specific market demands. As a student of the housing industry, I have found the entrepreneurship of builders to be enlightening and motivating. Today’s creation of large-scale developments evolved from a history of builders willing to make a vision a reality. The intent of this book is to capture the industry vision with practical know how and to prepare a guide for entrepreneurs willing to invest their resources into the next large-scale development.

My coworkers throughout my career have influenced my approach to large-scale development approaches. However, it is my family that has maintained the proper perspective on my career and has provided the support and encouragement needed to succeed in this business. I thank my fellow workers and my family for shaping and molding my views on how to successfully develop land and fulfill a vision.
Chapter 1

Comprehensive Site-Planning
Overview

1.1 Introduction

Properly planned and conceptualized large-scale developments are benefits to communities, developers, and end users. The essence of planning large-scale developments consists of an entrepreneurial focus on multiple land uses that complement the vision and financial commitment of the developer. The developer must rely on a talented design team and the willingness of the local government to review and approve large-scale developments. With technical and political insight, a successful large-scale development will succeed in even modest market conditions. Flexibility in both land use and land planning will also provide a developer a framework with which to create a point of destination and sense of community. This results in consistent land absorption and the creation of its own market. The technical aspects of large-scale developments will be addressed in subsequent chapters. Large-scale developments may be considered green developments, since both have the potential to provide sustainable and environmentally sensitive community designs, which would enhance the value and characteristics of the land form.

1.2 Role of Government

The traditional planning and zoning measures instituted in many communities have not embraced sustainable growth patterns and have only served to promote sprawl. The development of outlying areas is a direct function of land prices and the government’s land-use and zoning approach. Developers seek land on the fringes for easy to develop properties that have existing zoning in place. Many communities establish zoning districts that require land to be used for houses contained in stand-alone subdivisions that are only connected by roads and traffic corridors. Governments establish the rules, and developers must create designs consistent with
these rules. Otherwise, the onus falls on the developer to seek changes in the conceivable zoning or land uses permitted by governments. Flexibility and creativity are hindered and muted by the narrowly focused prudence of development and growth patterns by local governing bodies.

Governments have created a scenario in which land is consumed by new construction in outlying areas because properly planned densities are not being considered. In such a scenario, development sprawl will continue, and NIMBY (Not in My Backyard) and CAVE (Citizens Against Virtually Everything) attitudes will thrive. However, only local government can assess future growth patterns and determine the course of action best suited for future generations. The answer may be clear, but many communities will ignore it. Growth can be managed, allowing land to be used properly and effectively. The government needs to evaluate density’s effect on its populace and existing infrastructure. Implementing higher densities within existing urban areas would provide developers with flexibility in design and creativity. Density is the controlling factor in achieving a balance between the common good and the protection of the health, safety, and profit motive of a private entity.

Answers include the creation of large-scale development approaches that would provide market segmentation, sustainability, and a point of destination. Large-scale projects can achieve sustainability outside urban cores with the proper use of land through local government partnerships. Well-planned and conceptualized large-scale projects should not be viewed as a continuation of sprawl but as HOPE, meaning Housing Opportunities Please Everyone. Developers and industry professionals must cooperate with local government entities to achieve large-scale projects that provide HOPE.

1.3 Public Perceptions

For many years, national home-building companies have been the only ones with the foresight and financial means to design and construct large-scale projects. The general support of government and public in their vision has made this possible. It takes time, effort, and financial resources to hold land while the design approach is dissected. In return, the small- and medium-sized developers have been forced farther out from the core infrastructure. The public perceives builders and developers as profit-motivated disturbers of land and community values. Most builders and developers are reluctant to attempt something innovative on account of the regulatory acceptance hurdles and market reaction. Thus, the “same ol’ thing” causes the “same ol’ response” from the public. Furthermore, the public believes that builder-developers make significant financial returns, when in reality the returns on their investments are insignificant compared to higher risk industries. Also, since developing lots or building homes is their main enterprise, a portion of all profits are invested back into land for the next project.

Changing public perception of large-scale developments is a must for sustainable communities to thrive. Developers should seek a common ground to achieve a partnership of creativity, as flexibility and vision will allow large-scale developments to become integral parts of a community’s growth pattern. The development industry
is a fragmented compilation of visionaries striving to meet market demands. The government’s entitlement process and land restrictions create an atmosphere in which well-planned projects create a sense of compliance with the perception of government. This, in turn, will change public perception.

However, many NIMBY and CAVE advocates are results of a migration of the populace to warmer climates and less populated areas. Most advocates of curtailing development are people new to the area, since the community landowners continue to believe their land and their savings account are one and the same. The government must maintain a balance between conflicting interests. Large-scale developments molding land uses, density, architectural appeal and, as well, creative pedestrian and vehicle relationships will be essential components of thriving communities.

1.4 Builder and Developer Vision

Undoubtedly, not all developers are suited to create, design, and construct a realistic community project based on an idealistic visualization. However, large-scale development approaches provide a flexibility and forum at which master developers can excel at meeting the needs of the marketplace. Creating practical land-use relationships on large parcels of land is beneficial to local government. Large-scale projects combine the highest and best land-use approach, resulting in a comprehensive infrastructure design that complements the vision of the project. Large-scale projects are consequences of developers filling a market need.

As housing projects increase in land area, number of residential dwelling units, and nonresidential uses, the political and economic viability is elevated in importance, and the risk associated with the project is magnified. Large-scale projects require substantial finances and time commitments to complete. These resources, however, do not always guarantee a successful project. A large-scale land-use project requires purchasing large parcels of land and holding on to the land for a long period of time. To be successful, the master developer must properly manage the political influences throughout the entire process. Developing a large-scale land-use plan has substantial risks and rewards. Developers may minimize their long term risks by purchasing land below the market value. Developers must seek land-use flexibility to allow reaction to market changes. Absorbing the land at a reasonable rate while creating a sense of community and a point of destination will further enhance the profitability of the project.

In many communities, large tracts of land or consolidate properties to create a large tract of land can only be found in outlying areas. In highly regulated communities, a developer would be identified with perpetuating sprawl. This could be circumvented by forging an alliance with a local government that sees the benefits of a master-planned project. Developers would only approach market areas where the government appreciates the importance and value of a large-scale project. The risk is too substantial otherwise. Developers with a sound design, sufficient land, and government support can succeed at large-scale developments. Developers must orchestrate the fundamental components of a project plan for it to be delivered on time and within budget.
1.5 Design Professional Leadership

Large-scale development concepts are molded by a team of design professionals into a marketable plan. Designing program parameters and selecting design team members are the responsibilities of the developer. After all, the land-use-planning and development approaches established at the very initial phases of a project will cast a high level of commitment and risk. The importance of selecting appropriate design team members for the project can be neither overlooked nor minimized. Its importance has made it commonplace for developers to retain national experts with current industry knowledge and creative skills unmatched by local consultants.

Design teams should consist of members with various professional backgrounds, but it is the dynamic between the personalities that achieves an optimal land-use plan. It is all too easy for a strong developer personality to neutralize the creative approaches by the design team. Consultants must remain focused on the best interests of the property. In most cases, the land form’s location and market segmentation are the only ingredients to define creative alternatives. A balance between ingenuity and practicality must be achieved in order to make the project a success.

1.6 Land-Planning Concepts

No successful pattern or mold guarantees success in the design of a large-scale development. In many cases, new land-planning concepts are a revitalization of previous ideas. Other concepts are proven ideas with new, innovative spins. Also, not all creative land-planning techniques apply to every community. Creating a land plan or land-use plan starts with a developer’s vision for the property. The willingness and understanding of local government to consider a large-scale land-use plan would encourage developers to master-plan projects. The ingenuity of the design team members will create a plan having wide market appeal. These project components are a reflection of the land characteristics and attributes. If the physical, technical, and environmental elements of a site are ignored, the project potential will be negatively impacted. For large-scale projects, the marketplace is captivated by a sense of belonging created by complimentary land plans and land-use relationships (Fig 1.1).

1.7 Summary

Mixed-use developments, higher housing densities, and a sense of community are essential components to creative and cost-effective, large-scale land-development projects. In the future, home buyers will be attracted to communities that provide for employment opportunities and affordable alternative housing options. Large-scale master-planned communities have and will continue to offer a centralized place to live and work.

Large-scale projects will be the norm rather than the traditional hopscotch development patterns dotting our landscape. To achieve a profitable large-scale project,
government agencies, the general public, and private developers must seek common objectives that serve the existing community as a whole and offer viable opportunities for those seeking to balance work and family demands. Existing municipalities that are progressive and that forge compromises will attract builders, developers, and buyers to successfully create sustainable large-scale projects.

**DISCUSSION TOPICS**

1. Should government regulate the way land is used for development purposes?
2. How should design professionals interface with government to influence design standards?
3. What changes can government implement to ensure a balance is maintained between public and private interest toward developing land?

4. Are higher density projects a benefit or a detriment to the overall impact a project may have on a municipality?

5. Does this quote hold true for the building industry: “If you build it, they will come?”
2.1 Introduction

A large-scale project with a substantial amount of allotted land requires that the in-depth site-analysis work be completed by industry professionals. Not only is a site-analysis program needed during the purchase due-diligence period, but it is essential for the materialization of the land-use and land-plan studies. Comprehensive site-analysis work reduces the risk of buying the property, identifies problems with the property in terms of development and use, and highlights cost issues associated with the solution(s) to the problem(s). Site-analysis work is a combination of determining the technical constraints of a site as well as understanding its attributes. The investigative work must be approached from a critical point of view and be completely impartial. The facts must be discovered and addressed on their own merit.

Purchasing land as well as housing can become very emotional, and this must be guarded against during the review stage. Developers must walk away from purchasing land if the technical, regulatory, or political problems are insurmountable. Many developers attempt to force a project to work financially rather than to walk away and cut their financial losses. Obviously, landowner purchase-price concessions are the easiest ways to overcome the costs of resolving land-related technical problems discovered during the site analysis. The site-analysis work is an important component of a developer’s go-or-no-go decision-making strategy.

Site-analysis work separates the technical aspects of property. The intent is to eliminate land area from the gross acreage to obtain a net buildable area suitable for various land uses. Characteristics of the land should be illustrated on base plans, which will be used to determine suitable building areas while enhancing the attributes of the site. The land and its characteristics, if analyzed properly, will clearly define areas suitable for building. There are specific physical land characteristics that must be explored to determine the limitations and/or opportunities beneficial to the overall land plan.
Developers should consider a multidisciplinary professional consulting firm for site-analysis functions. This consolidates the services into one firm, which can be easily managed by a developer. The following site-analysis activities include listing of the design team members qualified to perform the tasks outlined.

2.2 Soil Analysis

Variations in soil characteristics will most likely occur as the property increases in size. Analyzing these variations is essential in determining any impact on the development approach. In some cases, the soil may preclude development in some areas. In other cases, technical modifications to the soil may produce usable ground and thus justify the expenditure of altering the existing soil characteristics. Soil investigative work should begin with examining all available published information. Soil conservation districts have sufficient information to allow for approximations of the various soil type locations on a property. This information will define both the characteristics of the soil type and the limitations of each for land-development purposes.

The soil characteristics outlined in the soil conservation district manuals should be supplemented with available information on locally delineated floodplains from Federal Emergency Management Agency (FEMA) mapping of flood-prone areas as well as wetland inventory maps to further delineate soil-type locations within the site. The soil characteristics will be used to identify areas for land-use planning and development purposes. The initial research would be transferred to a property survey. This soil characteristic plan should be used to identify areas suited for specific land uses and elements of core infrastructure (Fig. 2.1). This is only one important component in the preparation of a large-scale master plan. Once the land use plan and core infrastructure elements have been identified, the second phase of the soils program should be initiated.

The land-use plan will be used to develop an extensive on-site soil-investigation program, which would identify the boundaries and characteristics of each soil type. The importance of this work cannot be stressed enough, but a balance between procuring critical information and managing the cost of that information must be maintained. The goal of a soils program is to identify the subsurface conditions that will impact the land plan and foundation or roadway designs. All of which impact the cost to develop the land. The on-site soil-investigation program should include:

1. Identifying the soil types unsuitable for development, cost prohibitive to develop, or restricted by government from land-development practices.
2. Identifying soil characteristics that may not preclude development but may affect the land-plan and land-use layout for the property (i.e., expansive soils that may affect foundation designs).
3. Identifying unusual soil characteristics requiring atypical development costs. Some examples include rock formations requiring blasting, high groundwater requiring dewatering practices for utilities, slow soil permeability restricting storm-water management locations.
4. Identifying the depth of top soil for reuse or disposal.
5. Identifying the soil strata and the characteristics to determine the impact of an excavating condition generating fill material.
6. Identifying areas that should be used for recreational amenities or open area designs (i.e., golf courses, playing fields, community gardens, etc).

The land-use plan should be the basis for the preparation of an extensive soils-investigation program. Once the concept plan is completed, the soils consultant and design engineer should meet to discuss the technical aspects of the project. After this dialogue, the soils consultant will be able to use the land plan to prepare a soil-testing plan illustrating the location and type of each test to be taken. This approach would minimize unnecessary testing of areas set aside for open space, recreation fields, tree-save areas, and so forth. Each soil-test location is numbered and identified by GIS (geographic information system) coordinates. This information is
Chapter 2 Site Analysis

provided to the surveyor for field locating. A typical soil-testing program may include the following surveys and tests:

1. Survey the proposed centerline of the core roadways and perform soil tests every 300 to 500 feet. If the soil conditions vary significantly, this program can be altered to conform to the site conditions.

2. Soil tests and permeability tests should be performed within each storm-water-management basin. This method assumes the overall storm-water-management approach for the site will comprehensively control water quality and quantity at strategically located basins.

3. Testing should be performed in areas of multistory residential or commercial uses.

4. Testing should be performed in known areas of adverse soil conditions to better understand the subsurface conditions.

Based on the locale, soils-testing programs may be more extensive due to the nature of the site and soil characteristics. However, even with a consistent soil type, a soils program should still be developed during the site-analysis period. At the very least, the soil in the storm-water management basin areas and along the centerline of the proposed primary roads should be tested. This would assist in the initial planning as well as provide essential data as earthwork operations are undertaken to build the project.

At the site-analysis stage, there are two basic soil investigative work programs that should be considered: (1) soil borings and (2) test pits. Specific land uses may require soil-boring depths that cannot be achieved by a test pit approach. Typically, however, accessibility to the site and soil-test locations is the key factor in selecting a drill rig or backhoe to perform the testing. Soil borings will generally range in depth from 15 to 30 feet below the existing ground-surface elevation. If a soil-boring approach is critical to the understanding of the subsurface characteristics for the intensity of land use, the developer may be required to clear a path to make the test locations accessible to drill rigs. This situation would require a field survey of the exact test locations. A Standard Penetration Testing program may also be recommended for the site to estimate soil strength and density. This information becomes base data used for infrastructure and foundation-design elements.

One of the most significant cost considerations in developing land is associated with the impact of soil characteristics on the intended land uses. Extensive analysis of the on-site soil type will further identify the problems, benefits, and cost ramifications associated with the proposed development pattern. In large-scale developments, a comprehensive soil-testing program will help to select the land uses best suited for the existing site characteristics and conditions. Engineering design and construction activities are also affected by the characteristics of the site soils.

As an example, unsuitable material may be prevalent in low areas of the site and rock formations in other areas. This information combined with the slope
and topography analysis will further define areas suited for cost-effective development.

**Design Team Member**: Geotechnical engineering firm

### 2.3 Slope and Topography Analysis

Since many governmental entities regulate how steep or flat roadways can be designed, topography will also dictate where the roadways should cost-effectively be located for proper vertical and horizontal alignments. Compliance with local engineering design standards should guide the land planning of the core infrastructure. The topography of the site will also have a direct bearing on the distribution, location, and intensity of the proposed land uses. Large-scale projects can be initiated by using available topographic information. The use of USGS (U.S. Geological Survey) maps and local topographic maps is sufficient in preparing the initial land-use studies. Design consultants must properly locate the subject property on the topographic map in order to create the base map. Depending upon the conditions of the land purchase, developers may need to consider aerial topography. The cost of the aerial topography with field verification will be substantially less than a field-run topographic survey. This alternative method would expedite the planning and engineering design process. However, if the government approval process of the land-use plan is time consuming and the land-purchase agreement is time sensitive, the developer may need to use existing topographic information obtained from available resources such as the USGS. If the developer proceeds with the project, a field run or aerial topography survey will be required to ensure field accuracy for design purposes.

The topography of the site will directly affect the selection of specific land uses for specific areas. A simple example would involve commercial or industrial uses selected for flat ground rather than steep slopes. This is a result of expansive building structures and parking lot–coverage requirements associated with these types of uses. Flat or gradual sloping ground would minimize earthwork operations and thus provide a cost-effective design approach. In steeper areas, the potential land uses would need to be assessed for foundation design. The foundation design (i.e., residential basements) would change for steep areas, and walk-out basements would minimize grading operations. Multistory residential homes with walk-out basements or higher density residential product may prove cost-effective for steep-slope construction.

The terrain of a site is an essential component in the development of a large-scale land-use plan (Fig. 2.2). The design team will use the topographic information to formulate the uses that are most suitable for the specific site characteristics. The topography, along with the soils information, is essential in preparing the primary road layout and provide insight for developing utility-system layouts.

Surveying firms will establish their fees based on the acreage, property-line demarcations, availability of existing survey information, terrain, and level of forestation. Each of these factors will affect the time it takes to survey the property and the
Chapter 2 Site Analysis

Figure 2.2 Topography Survey. Undertaking the topographic survey during the due-diligence period will provide accurate land characteristics influencing the design program. Identifying steep slopes on the base map provides essential information for cost-effective infrastructure planning.

surveying fee. The final survey fee for a site is based on the specific characteristics of that site.

The surveying firm may also be required to locate wetland areas or floodplain limits on-site. This information is critical to the development of the land-use plan since most wetland and floodplain areas are not considered areas suitable for development.

**Design Team Member:** Surveying firm with the capabilities to undertake a defined scope of work within an agreed upon completion schedule.

2.4 Existing Land Characteristics

All too often, the existing land characteristics are not considered during the site-planning and land-use study of the project. Existing site features provide significant opportunities to formalize the land plan and provide an essential marketing theme, distinguishing the project from otherwise similar competition. The
planner, landscape architect, engineer, and developer should walk the property to evaluate the existing features and conditions of the site for design significance. A site inspection would highlight opportunities and constraints of the site features. Ensuing conclusions should consider the following categories.

**Existing Forestation and Vegetation**

Species and age of the existing vegetation should be taken into consideration during the planning of the project (Fig. 2.3). Specimen trees, typically those over 24 inches in diameter, could be the cornerstone of a development and may provide an important marketing ingredient for promoting the project.

Selective clearing is an operation executed to save masses of existing vegetation or specimen trees. This operation will increase the cost of clearing the property for development, but the results will provide tremendous perceived value and marketing edge. Maturity in plant material can be achieved through the passage of time or at great expense. It is more beneficial to outline a selective clearing plan that saves significant tree and vegetative cover. Selective clearing will require delineating areas

![Figure 2.3 Existing Vegetation Plan. Field locating existing forested areas and specimen trees is beneficial in locating specific land uses within the property. Saving trees will reduce clearing costs while enhancing the marketability of the project.](image)
to be saved in the field. During the site walk, these areas can be identified and highlighted on the base map.

Quality existing tree stands and understory areas provide substantial buffer and open-space opportunities, adding to the marketability of the site and exhibiting compliance with local regulations. Tree surveys may be necessary to identify specimen trees in the field prior to undertaking the land-planning process. The surveyor will locate trees of significance and illustrate the findings on the base map. These tree locations would be another consideration in the layout of roads, lots, and other land uses.

**Design Team Member:** Landscape architect

**Land Forms and Terrain**

It is important for land that has both appeal and interest to guide the land-plan approach. The undulations of the property provide street scene interest that cannot be duplicated by large-scale earthmoving operations. Land form and topographical interest should be used advantageously by the designer for the proper layout and implementation of a cost-effective engineering solution. If the land plan is not complementary to the land form, the cost of development will increase and, in some instances, cause the land plan to be unworkable. The result would necessitate additional land-planning concepts, cause a delay in the project schedule or require the developer to renegotiate the purchase agreement with the seller.

**Design Team Members:** Landscape architect and engineer

**Road Frontage**

The road project frontage is the “marketing window” to the development. Assessment should be made during the site inspection on possible access locations, sight-distance issues, frontage landscape treatments and road improvement requirements. The design team must also be aware of the existing uses across the street from the project. The access point locations are critical to the overall planning of the project. Large-scale projects may require multiple access points to existing external roadway networks. The selection for the main access and marketing window will establish the phasing and approach to the overall land-use plan. The secondary accesses should be designed to complement the main-access design.

Access to the property must meet appropriate engineering standards but also retain the ability to establish a statement of identity. The primary entrance design could be in the form of entry features, privacy walls, lakes, open-space vistas, divided roadway with landscaped median, etc. (Fig. 2.4). The presentation of the project at the primary access to the community is critical to the marketability of the project. This element of the design is important to highlight at the time of obtaining regulatory approval of the land-use plan. Road-frontage improvements and entry-statement work should be constructed at the start of the project. This entrance statement
2.4 Existing Land Characteristics

Figure 2.4  Property Road Frontage. Selecting the project entrance location should be based on achieving the most advantageous “marketing window” to the project. Developers should evaluate potential off-site road improvements while providing safe ingress and egress to the site.

establishes the identity and development tone for the project (Fig. 2.5). Along with a combination of creativity and practical engineering approaches, the entrance design will deliver a memory point that will differentiate the project from other projects.

Design Team Members: Engineer, surveyor, and landscape architect

Existing Streams, Lakes, and Ponds

Any existing water feature is a potential benefit to the overall development scheme of a large-scale project. Each type of water feature, however, presents interesting challenges from technical and regulatory points of view.

The simplest approach is to retain the natural features to complement the land plan and proposed uses. If the location or configuration of the feature is not conducive to adding value to a site, each feature must be reviewed for its potential benefits. Complete reconstruction may be required to retain the feature and maintain compliance with current regulatory standards. As an example, an old, existing farm
Figure 2.5  Project Identity. The “marketing window” includes an entrance statement to the community. Hardscape and softscape design features should be selected as memory points, constructed for ease of maintenance, longevity, and cost-effectiveness.

pond with a nonstructural embankment as a spillway may necessitate reconstruction if land uses are planned downstream of that pond. Not only will the cost be a factor but the site benefits must be judged appropriately and be consistent with government regulations. In this example, it may be beneficial to eliminate the pond and create an open-space feature used to channel runoff through the site, if government permits can be obtained for this activity. In most jurisdictions, existing water features are regulated. The presence or absence of wetlands, determination of floodplain areas, existing dam structures, depth of the water body, and safety and maintenance issues will have a bearing on the overall approach to the project (Fig. 2.6). These features may also require a lengthy regulatory permitting process, further hindering the project schedule. Again, site-analysis work encourages a negative view of existing features on their use, perceived value, and development impact. However, creative designs can use these features to enhance the ambience of the community that, in return, will add to market acceptance of the project.

Existing streams on the site are typically regulated by local ordinances, and in many instances they may be classified as jurisdictional streams by the Corp of Engineers. Perennial and intermittent streams may be regulated and necessitate buffers and
2.4 Existing Land Characteristics

Figure 2.6 Existing Water Features. Water features, such as streams, lakes, and wetland areas, are site characteristics that should be exploited in the land-use plan. These features provide significant vistas and views, adding perceived value to the overall project.

wetland delineations. Streams and water features add to the character of the site and also may be beneficial in the storm-drainage and storm-water-management design approach for the project.

Design Team Members: Engineering, planning, and environmental consultants

Vistas, Views, and Visual Impacts

Once the boundary and topographic base map has been prepared, the site should be analyzed for opportunities to enhance the project layout by complementing existing views. If any views or visual impacts are determined to be beneficial to the project layout, the design team members must walk the site to confirm their existence. Many physical features of a site are irreplaceable, and quality existing visual impacts are invaluable for marketability and buyer acceptance.

These features should not be overlooked in the land-planning phase. Quality existing site characteristics and features should become the focus of the design
Site planning for marketing purposes is a true perceived value. (Fig. 2.7). Land-planning approaches should strive to maximize the benefits of views and visual impacts by planning these features where the community as a whole can benefit. Another approach would be to isolate these opportunities to serve only a limited number of homes. However, as master developers of a large-scale project, it is more important to enhance the overall site attributes, resulting in increased value and marketability of the project through its quality existing site features (Fig. 2.8).

**Design Team Members: Planning and architectural consultants**

**Environmental Site Assessments**

During the purchase due-diligence period, it is important for the developer to authorize an environmental site assessment, which would include a Phase I study of
2.4 Existing Land Characteristics

In a large-scale project land-use plan, housing areas will be delineated by densities and perhaps unit types. This land-plan example used the site-vista plan (Figure 2.7) as a guide in arranging the building types on-site and locating the access locations to the existing road.

If the conclusion prompts further analysis, a developer would order a Phase II environmental study. These environmental assessments are important for financing and understanding the environmental liability of the site. There are significant tracts of land that have been environmentally damaged and will require significant cleanup operations. However, many of these properties may be purchased well below the market value, allowing the community and developer to add the land back as a productive tax contributor. Purchasing this land would also eliminate an eyesore as well as increase the value of the property by obtaining approval of a large-scale land-use plan as part of the cleanup operations. In many areas, these sites are described as brownfields. The development of a brownfield site requires significant expertise and financial strength to hold the land during the cleanup period. This may take many years before a new land-use plan becomes a reality and is approved by local and state agencies.

**Design Team Members:** Environmental, engineering, planning, and legal disciplines
2.5 Wetland and Conservation Analysis

Every site should be walked and analyzed for the presence or absence of wetland areas. In most states, wetlands are highly regulated at various levels of government. The quality of the wetlands will also have a direct bearing on how the wetland area can be utilized in the land plan. The options range from including wetlands in a conservation area to filling the wetlands in accordance with all mitigation regulations. During the site walk and after reviewing available information (i.e., soil maps, wetland-inventory maps, and USGS maps), the presence of wetland areas can easily be determined by an environmental consultant specializing in wetland analysis.

The wetland consultant would delineate the boundaries of the wetland area by placing flags. The survey crew would field locate all of the wetland flags and plot the areas on the base map. For large-scale projects, environmentally sensitive areas may require an elaborate permitting and approval process. Thus, it is advantageous to have the wetland consultant delineate any wetlands on-site prior to the survey crew undertaking the boundary survey. This will expedite the base-map preparation and further identify the upland areas suitable for development. The addition of wetland areas, buffers, or conservation easements to the base map will assist in preparing a land-use plan sensitive to environmental constraints. Any road crossings, drainage outfalls, and sewer alignments affecting any wetland area should be conceptualized during the initial design phase for cost and time considerations. This will also guide the design team to minimize circumstances requiring special design and permitting approaches.

**Design Team Members: Surveyors, engineers, and environmental consultants**

2.6 Floodplains and Stream Corridors

Natural drainage-conveyance features and floodplains delineated on Federal Emergency Management Agency (FEMA) maps and other ancillary documentation are important components to identify during the site-analysis phase. Floodplains will impact the land-use plan and the layout of any areas suited for development purposes. Many regulatory agencies preclude any disturbance in the 100-year floodplain area. Also, housing located adjacent to flood-prone areas may require flood insurance, which adds to the monthly payments of homeowners (Fig. 2.9). These are all factors developers must consider in creating a marketable land plan.

To clearly identify the limits of a floodplain, the watershed characteristics, drainage areas, and intensity of development or land uses will be used in computer-modeling programs designed to calculate the flood elevations along the stream corridor. A combination of survey information and engineering analysis is necessary to calculate the 100-year floodplain elevations, if required by local agencies. In many jurisdictions, FEMA maps are used to delineate floodplain areas on the land-use plan. This information is essential in preparing a practical land-use plan utilizing the land area suitable for development.

**Design Team Members: Surveyors and engineers**
2.7 Road Networks

Large-scale projects generate vehicle trips to and from the project site. Commercial, town center, business, or retail components of the land-use plan are all destination locations. The resulting traffic, along with vehicle movements from residential uses, will have an impact on the existing community infrastructure. Many elements of the traffic impact cannot be completely estimated until the land-use plan has been finalized. However, the initial land-use plan should be provided to the traffic consultant for a traffic impact analysis. This evaluation would include studying the ability of the existing roadways (e.g., travel-lane widths and right-of-way widths) to handle the proposed plus existing traffic volumes. Turning movements at intersections would also be analyzed. Improvements such as turning lanes, road widening, intersection improvements, and traffic signals may be required as a result of the large-scale master plan. These elements of the design may not alter the land-planning approach for the property, but any off-site improvement will add to the overall cost of developing the property. Developers must know both the political and financial ramifications due to the intensity of the development.
Existing roads may be owned by various governmental entities. Local, county, state, and federal agencies all own roads and rights-of-way throughout the country. Each agency will have specific requirements and details for compliance. Also, the permits resulting from any off-site improvement will also necessitate a separate critical path for approvals. A traffic engineer is the primary consultant for analyzing the traffic impacts resulting from the land-use plan.

The selection of the consultant should be predicated on their ability to work with the agencies, knowledge of the agency approval process, and professional reputation with the various levels of government.

Design Team Member: Traffic engineer

2.8 Utility Planning

All development projects require access to utilities (Fig. 2.10). Certainly, existing accessible utilities—with the capacity to accommodate a large-scale project—would be preferred. However, many utility companies have not kept pace with development patterns. This is especially true for public water and sewer systems. Many of the electric, telephone, and natural gas companies are proactive and monitor the development patterns and growth expectations continuously. With their forward planning, they are able to meet the demands of large-scale communities. This is not necessarily true for public water and sewer facilities.

Design Team Members: Water and wastewater engineering consultants and design engineer

2.9 Water Availability

Large-scale projects will significantly impact distribution-line capacity, water pressure, fire-department coverage, and water-supply availability. All are essential elements in developing any project. As the complexity and size of the project grows, the need to initiate discussions with the local water agency or company becomes even more critical to the viability of the project. Since large-scale projects are typically outside of urban core areas simply because of the massing of multiple land parcels, most water utility companies or agencies have not extended their facilities out from the urban core area. The typical scattered housing approach would have caused some lines to be extended in some areas—but not everywhere. A community may conceivably impose a moratorium on development until public water services can parallel growth and demand. The benefit of large-scale projects is that they allow developers and designers to plan for utility extensions and determine the improvements necessary to service entire large-scale projects. Without question, this issue must be evaluated very early in the planning stages, and exploratory meetings with regulators are essential. If the infrastructure must be upgraded, these costs may be allocated to all of the potential
land uses, but the expense to deliver the upgrade will be substantial at the beginning of the land development phase.

Providing water to the project site may include improvements such as: primary water-distribution-line extensions with road restorations, water-supply-storage facilities, water-treatment plants, purchase of water rights, or possibly siting a fire station. The cost for any of these improvements should be estimated during the due-diligence period to help understand the magnitude and issues necessary to negotiate a developers agreement with the jurisdiction. Developers may also work with the jurisdiction to create an improvement district that refunds capital expenditures by the developer.

*Design Team Members: Water and wastewater engineering consultants and design engineer*

### 2.10 Sewer Availability

The proximity of the large-scale project to available utilities is an important factor in determining the cost ramifications of a land-use change. For sewer, the topography will
also have a direct bearing on the feasibility of providing public sewer. Most treatment plants require considerable lead time and financial planning to expand the plant to add treatment capacity. Expansions will require proper funding, design, and permitting, all of which will take considerable time and planning. Most jurisdictions are deliberate in their expansion plans and are more cautious as development pressures increase. It is imperative for a developer to initiate discussions with the appropriate agency or sewerage company so that the feasibility of providing conveyance and treatment facilities to the large-scale project can be determined. During the due-diligence period an in-depth analysis should be completed on the how the project site will be served by sewer and if the treatment capacity is sufficient to handle the project. It is conceivable that a new treatment plant or an expanded existing facility may be required to handle the flow from the large-scale project site and the various land uses. Other costs may include: pump stations, new trunk lines, and expanding facility planning for future development areas adjacent to or near the project site.

Developers and their consultants need to make a “needs” assessment and approach the appropriate agencies with a plan that is beneficial to both the project and the community. A developer should enter into a developer’s agreement, which would outline the financial and construction responsibilities of all parties involved in conveyance and treatment of wastewater.

*Design Team Members: Water and wastewater engineering consultants and design engineer*

### 2.11 Electric, Telephone, and Gas Utilities

Many utility companies will have forward-planning groups willing to converse with developers of large-scale projects during the design phase (Fig. 2.11). The electrical and telephone companies partner on extending service areas. Some utilities will require a developer’s agreement to be executed prior to their initiation of design work. This may necessitate the developer posting monies up front. The extension of gas lines to serve a project is typically a business decision by the natural gas providers. In most cases, a large-scale development would be sufficient enough in scope to warrant the extension of natural gas infrastructure by the gas company, perhaps at no cost to the developer.

The proposed land-use plan is a guide in identifying the demands the project will have on the various utility companies. Discussions with the utility companies will be orchestrated by the developer with the assistance of the design engineer. An assessment of the need for easements permitting utility companies to extend their facilities should be prepared by the design engineer. For discussions, the developer should have an understanding of the project phasing and timetable in which to build-out the project. This, combined with the demand assessment of the various land uses, will be sufficient to initiate discussions with each utility company.

*Design Team Member: Design engineer*
2.12 Cultural, Historical, Archeological, and Endangered Species Analysis

Large-scale projects spanning many acres will undoubtedly elicit a special concern of the community or regulatory agency on the project impacts on the environment. Substantial research information is available from libraries, governmental agencies, and nonprofit groups on cultural, historical archeological, and endangered species issues. All of the appropriate groups need to be contacted and interviewed to assess site conditions that may demand preservation and/or restoration. This information needs to be verified in the field by design team members in concert with the associated special interest groups. It is important that any special circumstance be given attention in the land-use plan and adequately addressed in collaboration with each group’s concerns prior to commencing any public discussion.

The cultural, historical, and archeological influences vary from state to state and from jurisdiction to jurisdiction within each state. Volunteer or appointed committees of concerned citizens oversee these issues and the effect development has on their special interests. Most of these groups serve as advisors to political bodies but
Chapter 2 Site Analysis

are significant sources of information pertaining to community concerns requiring attention from developers. The investigation of the site conditions relative to the community history or heritage must be assessed, identified, and mapped in order to prepare the land-use plan.

The presence of endangered species must be determined at the initial site investigation or due-diligence period. This assessment should also predict possible changes during the lifetime of the project build-out since circumstances may change during the project completion. In most cases, a land-use plan approval does not alleviate the property from endangered species regulatory compliance. Thus, appropriate due diligence is necessary to provide a level of assurance environmental impacts can be minimized or properly managed during the construction build-out period.

**Design Team Member: Environmental consultant**

2.13 Surrounding Property Inspections

Any large-scale project will have multiple neighboring properties and uses. These properties should also be evaluated during the site-analysis stage. Existing or proposed uses of adjacent property may affect the marketability of the proposed large-scale project. The following courses of action need to be pursued by the design team members in preparing the overall land-use plan:

1. Obtain a recent aerial map of the subject site and neighboring properties to determine if any existing uses of the land are objectionable to the marketability of the large-scale project. The aerial map should have the property boundary lines clearly illustrated (Fig. 2.12).
2. Walk the perimeter property line of the subject site, take pictures, and assess the views and property conditions within the viewing area. Prepare a map illustrating the conditions on the adjacent properties. This plan will also be used as a guide in the preparation of the land-use plan.
3. Match the zoning and master-plan documents with the adjacent properties and determine the compatibility with the proposed land-use plan. Also, meet with local officials to assess their long-range zoning and master-planning initiatives to determine if land uses may change in and around the subject site during the build-out of the project.
4. Obtain transportation master plans for future road alignments in the area. Determine if any of these future alignments will impact the subject property and if any of the future improvements are a condition of approval for the project.
5. Using the aerial map with the boundary lines shown, the adjacent and surrounding properties should be analyzed for possible annexation into the property confines for better configuration, access to existing transportation links, or marketable site features.
2.14 Summary

Figure 2.12 Surrounding Properties. Large-scale projects encompass large land areas that border multiple parcels. The adjacent property should be assessed for development potential and added acreage to the project site. Gain development control and guide the land use of adjacent properties. This will enhance the marketability of the project.

6. Determine if any adjacent properties must be included in the planning of the large-scale project for connectivity, utility service, or buffering.
7. Determine if the property may be annexed into an incorporated jurisdiction for ownership and maintenance of the infrastructure.

Design Team Members: Land planner, engineer, and architect

2.14 Summary

Public information and resources are readily available to supplement the site investigation and evaluation program. The purpose for extensive research is so that the developer and the consulting team can ascertain the problems in developing the property in a cost-effective and timely manner.
Site-analysis work must be extensive and approached with a negative, skeptical, and inquisitive mind-set (Fig. 2.13). Identified site constraints may be resolved by political solutions or cost-effective engineering design approaches. If the problems cannot be resolved in a timely manner or within practical financial considerations, the master developer may decide to abandon the purchase rather than justify a go business decision.

The site-analysis work should include document research and information gathering at all levels of government. Contacting the following agencies or groups could provide invaluable information necessary to ascertain the development potential of the site and the impacts the project may have on the existing community. This research would also identify regulatory permitting issues and regulatory impressions on the development potential of a specific site.
### Federal Government

Federal government departments have extensive database, maps, and documentation useful in the planning and development of large-scale projects. Various federal agencies will most likely become involved in specific projects for permitting certain aspects of the project plans.

<table>
<thead>
<tr>
<th>Agency</th>
<th>Database/Information</th>
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<tbody>
<tr>
<td>Agriculture Department</td>
<td>water quality, watershed database</td>
</tr>
<tr>
<td>Bureau of Land Management (BLM)</td>
<td>public land maps, rights-of-way information</td>
</tr>
<tr>
<td>Federal Aviation Administration (FAA)</td>
<td>air quality, noise, flight patterns</td>
</tr>
<tr>
<td>Federal Emergency Management Agency (FEMA)</td>
<td>flood maps, floodplain management</td>
</tr>
<tr>
<td>Federal Highway Administration (FHWA)</td>
<td>transportation facilities, air quality</td>
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<tr>
<td>Housing and Urban Development (HUD)</td>
<td>fair housing practices, ADA (Americans with Disabilities Act), historical data</td>
</tr>
<tr>
<td>Natural Resources Conservation Service (NRCS; originally called the Soil Conservation Service)</td>
<td>soil maps, erosion control</td>
</tr>
<tr>
<td>U.S. Army Corps of Engineers (USACE)</td>
<td>nationwide permits, wetlands</td>
</tr>
<tr>
<td>U.S. Census Bureau</td>
<td>demographics, population, market trends</td>
</tr>
<tr>
<td>U.S. Department of Agriculture (USDA)</td>
<td>water quality, watershed database</td>
</tr>
<tr>
<td>U.S. Environmental Protection Agency (EPA)</td>
<td>clean air and water acts, database, drainage</td>
</tr>
<tr>
<td>U.S. Fish and Wildlife Service (FWS)</td>
<td>endangered species, coastal wetlands</td>
</tr>
<tr>
<td>U.S. Forest Service (FS)</td>
<td>property acquisition and surveys</td>
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<tr>
<td>U.S. Geological Survey (USGS)</td>
<td>water-resource database, aerial, maps</td>
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### State Government

The responsibilities of each state agency generally mirror the scope of the federal government department but are expanded or reduced in scope by each state. The state agencies will have more specific information for the area in which the large-scale project is located. Most agencies will have maps, aerals, and supporting documents available for public use. Also, a typical large-scale project would also require state permits and approvals for certain aspects of the project plan. There may also be regional quasi-government agencies that may have jurisdiction over land area within the state. Separate standards, criteria, permitting, and approvals may be imposed by the regional agency.
### Local Government

This is the most important layer of government for assimilation of information specific to an area or for a specific property. The site-analysis investigation should include document research at the local level.

<table>
<thead>
<tr>
<th>Consumer Affairs</th>
<th>homeowner and community associations</th>
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<tbody>
<tr>
<td>Department of Agriculture</td>
<td>water quality, maps</td>
</tr>
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<td>Department of Commerce</td>
<td>economic development database, market database, demographics</td>
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<td>Department of Cultural Resources</td>
<td>historical sites</td>
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<td>Department of Environmental Protection</td>
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<tr>
<td>Department of Health</td>
<td>soils, wells, septic systems, commercial</td>
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<td>Department of Transportation</td>
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<td>Geological Survey</td>
<td>soils database</td>
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<tr>
<th>Cultural and Historical Societies</th>
<th>historical registry and property database</th>
</tr>
</thead>
<tbody>
<tr>
<td>Economic Development Commission</td>
<td>business, commercial, and retail information</td>
</tr>
<tr>
<td>Environmental Commission</td>
<td>wetlands, local regulations, maps, history</td>
</tr>
<tr>
<td>Fire Department</td>
<td>overall review of the land-use plan, design criteria, approval of site-development plans</td>
</tr>
<tr>
<td>Health Department</td>
<td>wells, septic systems, permitting</td>
</tr>
<tr>
<td>Library</td>
<td>local background information on property</td>
</tr>
<tr>
<td>Office of Planning and Zoning</td>
<td>regulations, permitting, zoning maps, master plans, general plans, applications, adjacent property information</td>
</tr>
<tr>
<td>Planning Board, Council Members</td>
<td>political insight and community hot buttons</td>
</tr>
<tr>
<td>Police Department</td>
<td>road names, traffic patterns, addresses</td>
</tr>
<tr>
<td>Public Works Department</td>
<td>road standards, maintenance requirements</td>
</tr>
<tr>
<td>School Boards</td>
<td>existing-facility analysis, future planning, costs per student, assessment of impacts from development projects</td>
</tr>
<tr>
<td>Sewer Department</td>
<td>existing-facility plans and treatment-plant capacity, design standards, planning and permitting, as-built surveys</td>
</tr>
</tbody>
</table>
### 2.14 Summary

<table>
<thead>
<tr>
<th>Source</th>
<th>Information Provided</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shade Tree Commission</td>
<td>local knowledge of vegetation, regulations</td>
</tr>
<tr>
<td>Tax Assessors Office</td>
<td>land and property values</td>
</tr>
<tr>
<td>Town or County Engineer</td>
<td>existing infrastructure plans, maps, design criteria, standards, public infrastructure planning, development patterns, permitting</td>
</tr>
<tr>
<td>Traffic Department</td>
<td>traffic counts, database, road classifications, future planning of transportation links</td>
</tr>
<tr>
<td>Water Department</td>
<td>existing-facility plans and water availability, design standards, planning and permitting, water pressure, as-built surveys</td>
</tr>
</tbody>
</table>

#### Other Sources

In addition to government agencies, it is prudent for the master developer to meet with other groups to further understand the local sentiment toward development and to gather local knowledge about specific property. In many cases, the local knowledge provides significant insight on the development potential of the site and may uncover a marketing edge for the developer.

<table>
<thead>
<tr>
<th>Source</th>
<th>Information Provided</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chamber of Commerce</td>
<td>property database, economics, businesses</td>
</tr>
<tr>
<td>Home Builder Associations</td>
<td>politics, trends, standards, criteria, approval process, market potential, industry overview</td>
</tr>
<tr>
<td>Internet Sources, e.g., Google Earth</td>
<td>aerial photos, adjacent uses</td>
</tr>
<tr>
<td>Land Development Contractors</td>
<td>understand local site constraints and conditions, may know the problems associated in developing a specific site</td>
</tr>
<tr>
<td>Long-Time Community Residents</td>
<td>perspective on politics, history of property</td>
</tr>
<tr>
<td>Neighbors</td>
<td>site history of use, site problems</td>
</tr>
<tr>
<td>Nonprofit Organizations</td>
<td>market and community knowledge</td>
</tr>
<tr>
<td>Realtors</td>
<td>property values, commercial, retail markets, pricing, development pace</td>
</tr>
<tr>
<td>Well Drillers</td>
<td>groundwater, water resources, soils</td>
</tr>
</tbody>
</table>
DISCUSSION TOPICS

1. What are the two most important site characteristics to be assessed during site-analysis work? Why?
2. Would you rather design a housing project in flat terrain or on steep slopes? Why?
3. What are the two most important site characteristics used to market the project? Why?
4. If someone was selling property based on gross acreage, what site-analysis conclusions could be used to reduce the land price? Why?
Chapter 3

Base-Map Preparation

3.1 Introduction

The base map is a compilation of the technical data and information obtained during the site inspection, public document retrieval, and site-analysis work. The base map combines this information into a primary working document that defines important site characteristics necessary in formulating a land-use approach. The base map may be several overlaid maps that should have the nonbuildable or severely restricted areas identified. In essence, the base map illustrates the constraints and attributes of the property. The constraints indicate possible limitations in development, while the attributes display the areas most suitable for development. The areas identified for development should be further analyzed for specific land uses. The base maps can be prepared by several design team members, but they are typically compiled by the land planner. To initiate any design work, the base map and associated constraint maps need to be assembled by the master developer.

3.2 Boundary Survey

This base map uses the title report for the property, other recorded documents, and an actual field survey of the property. This document must include constraints on the property that were only discovered through property investigation. In reviewing the property survey, the elements of the survey that may encumber the property or reduce the buildable area should be identified. The boundary survey is a legal document prepared by a licensed surveyor. The surveyor must be licensed in the state in which the work will occur. The land surveyor will work with local government, the property owners, and title companies to research the property and undertake a field-boundary survey to prepare the base-boundary survey for the property. In checking the survey,
master developers will review the following information with regard to how it may impact the development potential of the site:

- Physical encroachments upon the property from adjacent property owners
- Gaps in the property lines between adjoining properties and the ownership of those areas
- Overlaps of the property lines between adjoining properties that can cause unanswered questions concerning the ownership of the land
- Exact location of property lines along the existing roadways fronting the site
- Existing easements affecting the property (i.e., gas, electric, water, and/or sewer easements)
- Flood plains and/or wetland areas
- Ingress and egress easements encumbering the property

3.3 Topographic Survey

The shape and contour of the property is depicted on the base map by a land surveyor. Since the terrain will dictate the road grades and the distribution of land uses, the information contained on the topographical survey is essential to the overall design of the community. For example, it is more cost-effective to place nonresidential uses on flatter ground, since the site will consist primarily of larger building footprints and parking facilities.

Also, in many markets, builder-developers must not construct residential units on slopes greater than 15 percent. However, in mountainous terrain, this limitation is not imposed. Steep land forms may cause problems in grading, residential foundation designs, and usability of backyards. Steeper grades and the need to increase buildable area will result in higher earthwork, clearing, and retaining-wall construction costs. Extremely flat terrain, found in many areas of the country, causes the master developer and engineers to manufacture topography through major earthwork operations. Undulations must be created in flat ground to ensure minimum road grades, cost-effective storm-drainage design, and adequate yard grades for lot drainage as well as to use a gravity-dependent sewer system design. The topography base map provides a three-dimensional (3-D) view in two dimensions.

The topographic survey can be accomplished by a field survey or aerial photography. The aerial topography has to be field established for accuracy. The surveyor must ensure the elevations of the property are in a datum or base elevation acceptable to the local reviewing agency. If an assumed datum is used, the base map should identify the existing features used in establishing the base elevation. The time of the year and vegetative cover will affect the decision to proceed with an aerial. Aerial topography may be most cost-effective when dealing with a large-scale project that encompasses many acres and parcels of land.
3.4 Existing Land Characteristics

The existing conditions of the property are depicted on the base map prepared by the surveyor to include field inspection notes and observations. The presence and alignment of perimeter and frontage roads will determine access points from the property and illustrate a possible inability of the existing roads to handle increased traffic. These factors would include pavement condition, width of the roadway, vertical alignment for sight distance, and horizontal alignment for minimum horizontal centerline–radius compliance. The field survey should also identify tree lines, streams, and water features (farm ponds, etc.). Many local jurisdictions are now requiring tree surveys for specific size trees, for example, having a diameter of over 8 inches. Also, specimen trees should be field located and shown on the existing land–characteristics plan.

The approach to using existing tree and vegetative–save areas has a perceived value that cannot be duplicated with a reforestation approach. In distributing land uses, the existing natural cover of the property should be taken into account for establishing open space. Existing buildings, roads, driveways, and other existing uses should be included on this base map to further illustrate the development potential of the site.

3.5 Soil Characteristic Map

Another base-map layer should illustrate the various soil types as outlined in the Soil Conservation District soil surveys, which can be obtained at www.websoilsurvey.nrcs.usda.gov. Labeling the soil types and using available resources to identify the specific characteristics of each soil type will define the development potential of the property. The soil characteristics disclosed in government property surveys should be investigated on-site by establishing a soil-testing program that includes soil borings and test pits. Based on documented soil types, the changes should be illustrated on a base map.

This illustration will further define the development opportunities that would minimize excessive earthwork operations and unusual cost implications (Fig. 3.1). The field-mapping exercise is not only a study of the soil conditions but also a planning tool for the entire development process. The master developer needs to work with a geotechnical engineering and materials testing group to create a testing program that would further define on-site soil properties and determine their impact on the planning and construction process. The following information should be compiled during the planning phase of the project:

**Permeability of the Soil:** This test result will have a direct bearing on the storm-drainage and storm-water management design for the project. The permeability of soil defines how well the soil drains through water infiltration. This assists in placing detention storm-water management basins in the proper location, allowing the basins to drain within a short period of time and to eliminate the potential for standing water. Also, high-intensity uses and high land costs may require underground infiltration basins to control the water
quality and quantity from the site. These facilities will rely in part on the infiltration characteristics of the soil to determine the facility design.

**Shrink-Swell Potential:** In many locations, the quantity and type of clay in the soil may have a significant impact on the development potential of a site. In essence, the plasticity of the soil is a determination that should be based on the expansive characteristics of the material. Expansive soils will impact the development and foundation costs for the structures. If the site is located in an area known for expansive soils, an extensive on-site soil investigation program may be warranted.

**Seasonal High-Water Table:** This is the highest level that the water table reaches in the soil profile. The seasonal high-water table is determined by soil mottling, and the results may affect foundation designs, underground construction methods requiring dewatering, and on-site septic-system designs.
Frost levels, extent of rock, and unsuitable material are also important elements in the development process that may affect the cost of developing the project. However, if certain areas with high development costs can be planned as open-space areas in the land-use plan, the master developer may minimize the cost exposure while creating open areas within the development.

### 3.6 Environmental Mapping

During the site-analysis phase, design team members should assess the environmental concerns and identify those areas requiring a more in-depth examination of the constraints. The limitations resulting from environmental concerns should be illustrated on the base map. Wetland areas and associated buffers also need to be shown on the base map. These areas generally are considered to be nonbuildable areas, and land uses and development patterns should complement these areas as open-space use. It is possible that a portion of the wetlands will need to be assessed as a developed area, but the appropriate mitigation program would be pursued during the design phase. The wetland areas and topography will be evaluated simultaneously for road, pedestrian, and utility-line crossings. The plan should illustrate available alternatives to land disturbances within environmentally sensitive areas.

The *environmental illustration* includes any flood plain and flood fringe areas within the site. These areas are more comprehensive in this illustration than in the initial assessment made during site analysis. A flood study may be required to determine areas not conducive to cost-effective development practices. Any endangered species on-site or within close proximity to the site needs to be identified and shown on the plan. Many local, state, or national regulations require substantial buffers from any known endangered species areas. Since development will be restricted in these areas, these buffer limits should be illustrated on the plan.

### 3.7 Road and Utility Connection Map

The boundary and topographic survey will provide the base information for adjoining road rights-of-way. Many local governments will encourage connectivity between adjoining properties. The land plan would depict any connections to existing “dead-end” roads and access points to frontage roads. Consideration should also be given to the illustration of any road improvement plans projected by local government. Many progressive municipalities plan for future transportation links, which may affect the property in question.

Many local master plans will show future road alignments, which will encumber the property and affect the land-use plan for the large-scale project. Also, connecting to adjacent existing roadways will provide secondary or multiple access points for public and emergency services in addition to providing convenience of travel. Adjacent major road intersections should also be shown due to the impact that a large-scale community would have on the existing infrastructure (Fig. 3.2).
Figure 3.2 Road Network. Connectivity for road and pedestrian corridors enhances sustainability and community function. The hierarchy of the internal road network will properly distribute traffic on roadways classified in accordance with their use and function. Large-scale projects with sensible road networks will silently market the project.

This plan should also identify the location of existing water, sewer, gas, electric, telephone, and cable services. Connecting to the water and sewer lines is both a cost issue and a phasing issue. The site-analysis work would identify any line- or treatment-plant capacity issues that result from a large-scale project build-out. The utility connection map presents another factor to consider in the preparation of a practical large-scale project master plan.

3.8 Opportunity-Constraints Map

The opportunities in land development, housing construction, and community development are numerous and site specific. Many opportunities are on-site, but the adjacent properties also present chances to supplement the marketing or land-use planning (Fig. 3.3). Opportunities to consider are:

- Community primary-entrance location relative to perimeter road system
- Adjacent existing land uses complementing the community plan
- Major roadway network systems for regional access
- Existing community features (i.e., government facilities, parks, etc.)
Figure 3.3 Site Opportunities. There are positive and negative constraints for each project site and neighboring property. Even negative site constraints, such as views, should be addressed in the land-use plan. Environmental constraints should be viewed as a positive influence on the land plan. Sustainability can be achieved by using environmental constraints cost-effectively in the design and in financial gain through creative marketing.

- Views and vistas
- Open-space elements
- Fire and first-aid stations
- Schools
- Business centers and employment areas
3.9 Land-Use Plan Base Map

The land-use plan base map (see Figure 3.4) will combine the individual illustrations to ensure that the usable and desirable areas within the project site are maximized for the best use. The overall land-plan base map provides an illustration of the technical and beneficial opportunities of the site and adjacent properties. This base map would clearly indicate areas for various land uses and development patterns.

Figure 3.4 Land-Use Plan Base Map. In-depth site analysis and accurate field data transforms a boundary and topographic survey into a pictorial discovery in which the land should best be utilized and transformed into a livable and sustainable community.
3.10 Summary

Correct and verifiable technical information obtained by industry professionals in the preparation of the base map is essential to the successful analysis of the property as a large-scale development. This base map should be prepared during the due-diligence period to ensure that a land-use plan is also prepared during the initial assessment period. The initial land-use plan will not only illustrate the residential lot yield and the land set aside for nonresidential uses, but the plan will also define the construction requirements of the master developer. The cost of the land plus the revenue projections and less the common area expenses will be a snapshot of the financial viability of the project. Once this is ascertained, the master developer will proceed with additional iterations of the land-use plan. The quality of the information obtained for the base map significantly influences the way the land-use plan will be designed. Master developers should take a “hands-on” management approach in preparing the base map. The importance of this approach is reflected in a project designed on time and within budget from the outset.

DISCUSSION TOPICS

1. Even at substantial upfront expenses, why should a master developer proceed with the boundary and topographic survey before closing on the property?

2. What construction operations of the project will be affected by a high-groundwater table?

3. What are the benefits of combining the soils map with the topographic map?

4. How important is it in the go or no-go decision-making process to walk and inspect the property and why?
Chapter 4

Marketing Studies and Market Considerations

4.1 Introduction

The land-development business is no different than any other industry where success hinges on the marketability of a product. For a prolonged period of time, the housing industry has seen steady growth in all market segments. The need for market research to determine how the market will affect a project design program has been minimized due to the strength of the marketplace. Most builders will approach their projects in a manner consistent with current projects in the area, or they will focus on project types with which they have already had success, because the costs for these developments have already been established. Builders may be able to succeed with a project without a single family–detached market study. However, as densities increase or the project size increases, the need for a defined and current market study is essential. A market study is also indispensable in creating the land-use plan for a large-scale project.

A developer’s commitment to a long-term build-out of a large-scale project must form a solid foundation by performing a thorough market analysis. Maintaining flexibility in the highest- and best-use approach for a large-scale project will be necessary in order for a developer to conform its design program to changing market demands. Also, builders of “niche” market projects will spend more time and effort on a market study to microanalyze the buyer’s wants in a specialty project. The build-out pace of a large-scale project is contingent upon the ability of developers to sell and construct projects with diverse land uses. In preparing the land-use plan for a large-scale project, the market study should outline the depth of each market segment, including residential, commercial, and industrial uses.

This chapter will outline the process of structuring the overall design program for a large-scale project. The marketing of the project will utilize all available media resources for targeted markets. Typical marketing approaches include print media,
radio, TV, direct mail, telemarketing, Internet, open houses, and special events. Housing styles, design features, recreation-facility designs, and nonresidential uses should also be discussed in detail with focus groups. In fact, multiple focus groups would further solidify the design program for the project. Focus-group management is a specialized field. Focus groups are an excellent tool used to verify design approaches before expenditure of construction monies. The level of detail can vary, but master developers of large-scale projects can benefit from an extensive discussion with patrons willing to share their opinions.

4.2 Preparation of a Market Study

The developer of a large-scale project should prepare a long-term pattern of development based on current market conditions as well as those projected over the build-out life of the project. As a master developer, the commitment of financial resources is substantial and must be a result of sound market judgments. Most developers must retain the services of a market research firm to analyze historical, current, and projected housing demands within the limits of influence and regionalization of the project. The study would also address the retail and office needs of a community. Market information is derived from public information and supplemented with data from projects under construction.

For a large-scale project, it is important to understand the development trends of the area in which the project is located. For residential projects, an evaluation should be made of the annual market demand in comparison to the housing projects already present, under construction, and planned in the community. The commercial, retail, and office space components of a large-scale project can easily be defined by analyzing the currently available vacant space and the planned square footage. The chamber of commerce and local economic-development committees and groups maintain the most recent facts on the economic viability of a community. This will assist in defining uses that complement or expand the tax base of a community.

Early research will focus on the residential demand by outlining the demographic data collected from various public sources. Demographics and population trends, household formations, household-income levels, employment opportunities, and housing-values data should be compiled and analyzed in developing the project design program.

4.3 Demographics

Vital statistics of the population and growth patterns are essential elements of a market study. In housing projects, the population size, characteristics, growth, and demand must be defined so that the appropriate land uses can be included in the overall plan. Large-scale projects must concede to a wide range of housing alternatives with defined market segmentations governed by price points and demographics.
This approach would provide land-use flexibility, as markets may change over the life of the project. Basically, the demographic section of the market study should answer the question that asks who will purchase the land and where are the buyers from.

Market research firms will offer recommendations concerning the characteristics of the market, the depth of the market, and the locations from which the buyers will come. The report is an analytical interpretation of known facts. Due to the long-term commitment of a large-scale project, this data must be compared to regional information and trends. Developers must always maintain land-use flexibility to combat market instability over the life of the project.

### 4.4 Household Formations

If the population has made a historically consistent increase over the years, the demand can be measured with a high degree of accuracy. However, since most communities fluctuate in population growth, it is important to assess the social changes that may cause an increase in household formations (i.e., divorces, marriages, migration, etc). These household formations must be weighed against the population-growth projections to determine the appropriate land-use allocations. The census, state and local government agencies, and local colleges are important resources from which to obtain housing data. An assessment of the current and projected demand defines an estimated absorption schedule, which will ultimately highlight potential financial pitfalls.

### 4.5 Household-Income Levels

This statistic analysis will provide sufficient insight on the area that supports housing components and retail enterprises. The income levels will assist in identifying the price points for residential uses. However, for large-scale projects, the marketing approach for the residential projects may extend to other regions of the country. As an example, if the project includes an active adult community, it must be determined if the half-back market will influence the price points of the housing product designed specifically for the retirement market. Large-scale projects need to show housing diversity, and the first-time home-buying market should be an important aspect of the housing plan for the project. The first-time home-buying market has become a niche market due to the sensitivity of mortgage rates and the effect that pricing strategies have on the ability of the first-time home buyer to purchase. The household-income level analysis and year-to-year comparison will also influence the nonresidential approaches for the large-scale project. A successful large-scale project will properly consider the demands of the market in terms of housing opportunities and commercial enterprises. The market may define the commercialization of a large-scale project by pointing out that commercial uses can be decentralized and spread throughout the project and be on a residential scale rather than to maintain a big-box approach.
4.6 Employment Opportunities

Data of this type can be obtained from the Chamber of Commerce, Economic Development Commissions, and various governmental agencies. The economic viability of a community is well analyzed and is always a political topic of conversation. A large-scale community has an opportunity to create also long-term employment opportunities, beyond those in typical retail stores. Planned business or office parks, industrial campuses, and traditional neighborhood developments are essential components of a large-scale project that can produce pedestrian-scale communities in which the opportunity exists to live and work in the same neighborhood. Employment opportunities will be created by the inception of a large-scale project, but an immense development does not have to avoid entirely an attempt to create a sense of community. Residential-scale designing—for people instead of cars—and providing a destination, or hometown, should be incorporated into the planning concepts for a large-scale project.

4.7 Housing Values

Trends in the housing market are key indicators of the strength and depth of the local housing demand. A large-scale master-planned community will have a long build-out time frame, possibly spanning several peaks and valleys in the demand curve and housing appreciation. However, the benefit of a large-scale project is the ability to purchase or option the land below market prices. In most housing “valleys,” existing home prices will adjust downward; new homes will be sold with incentives; but land prices will not depreciate significantly. Thus, the planning of a large-scale project should consider infrastructure phasing, housing-price points, and land-use flexibility. Since the industry is fragmented and housing prices are just as varied, the housing analysis must be expanded in scope to include adjacent market areas. A large-scale project is a destination, and creating a sense of community through proper planning will attract the rooftops and complementary commercial components. Most markets have experienced steady appreciation of prices, and in some instances, a housing “bubble” may exist. If the market under consideration seems to be artificially inflated, an inspection of the issues causing this phenomenon should be performed. If the intent of the design program is to diversify all price points and appeal to markets other than luxury homes, the initial housing phases should consider sale prices below the market values.

4.8 Supply Analysis

This analytical approach is an assessment of the sales, permits, closings, inventory, and housing-projects pipeline within a specified market area. The importance of this element of the market study lies in defining the absorption rate, which a developer will establish during the assessment of the build-out projections for the large-scale
community. Land is absorbed by selling parcels, developing lots for builders, or building homes on lots purchased or developed for your own use. In cash-flow analysis, a reasonable absorption rate should be budgeted in the very early stages of development. In some markets, developers and builders are separate entities. In other markets, however, they may be the same firm or even a builder-developer. An understanding of land use in the marketplace will also affect the ability of a master developer to distribute the land uses and zoning for each residential land use. Research should be undertaken to determine if:

(a) land speculation or banking of land for future use is artificially escalating land prices;
(b) developers are purchasing land to produce lots for builders and other end users; or
(c) builder-developers are optioning land for their own building operations.

Each option provides opportunities for a master developer to meet market demands. Before purchasing large projects or individual lots, the developers, builder-developers, and builders available should be identified. Marketing of a large-scale project may extend beyond the local market area, and master developers should initiate discussions with national builders.

4.9 Ownership Alternatives

Large-scale multiuse projects are constructed by master developers. The spine infrastructure, amenities, and common elements are constructed by the master developer. This entity may also be involved in the marketing, sales, and construction of a specific land use. However, the master developer will most likely retain management and ownership control of the essence of the community and sell the specific land-use areas to different building entities. The absorption of the land can be achieved through land uses and by ownership designations. In most cases, large-scale projects will have an umbrella community association created to own and maintain common elements throughout the project. However, each land-use area or project will have their own mechanisms in place for ownership and maintenance responsibilities of that specific project. Ownership and maintenance documentation must be consistent with all applicable laws and registration requirements. Thus, these documents are legal in nature, and the proper legal preparation and review is necessary. Master developers must protect the outcome and longevity of the vision through creative covenants and restrictions. The microdevelopment patterns should still consider the basic ownership alternatives: fee simple, condominium, and rental-housing projects.

The defined land uses can be approached with any of the three ownership alternatives. There are other ownership options that are not mainstream and perhaps not widely accepted (i.e., land leases or cooperatives). Most large-scale projects will designate specific projects by ownership as well.
4.10 Fee Simple Ownership

Home owners own their home and the property on which the home is situated. The lot will be defined by a property survey and is generally recorded by a deed and survey map in the jurisdictional court house. Both detached and attached houses can be sold in fees simple. As an example, a townhouse can be situated on a 20-foot by 90-foot lot and owned in fee simple but also have covenants and restrictions imposed on the use of the lot. Each fee simple lot will also have front-, side-, and rear-yard setbacks to restrict the use of these areas for principal structures. Certain zoning regulations permit the use of the setback areas for accessory buildings (i.e., sheds). Fee simple lots may also be encumbered by other elements of infrastructure design, including drainage easements, tree-save areas, wetlands, floodplains, utility easements, etc. The easements are encumbrances on the lots. This is a result of the engineering design; but easements can be limited through value engineering. Fee simple housing projects are generally serviced by public utilities and public road rights-of-way. Consideration should also be given to having fee simple lots front onto a recorded ingress-egress easement in lieu of a public right-of-way. This approach would allocate more taxable land to each lot, and the private road would then be owned and maintained by the community association. Fee simple ownership can also be associated with office, business, and industrial parks where the land is sold in fee and the entity builds their own building or facility.

Active adult communities can take a variety of forms in terms of ownership and maintenance responsibilities. The combinations are not extensive but are extremely sensitive to the market segment. Typical combinations are:

1. Fee simple ownership with an overall association for only common elements such as roadways, recreation facilities, etc.;
2. Fee simple ownership with comprehensive maintenance of common areas and building exteriors; or
3. Fee simple ownership served by public roadways and utilities.

4.11 Condominium Ownership

This ownership arrangement can be associated with commercial, office, and industrial uses, but it is traditionally used by the residential industry for an alternative approach to conveying ownership. Condominium ownership is not only delegated to high-density projects; single-family detached homes could be conveyed as condominiums as well. Generally for condominium ownership, the home owner owns the interior spaces of their home (sheetrock to sheetrock), and the condominium association owns the common areas, including the unit exterior walls and roof. With this ownership, the association must maintain the common areas and exterior fenestrations of the building. The benefits to the home owner include a reduction in exterior lawn- and building-maintenance costs and lower real estate taxes. The home owners also benefit from having common-area amenities and recreation facilities included in
4.13 Product Description and Attributes

the community design. However, the monthly association dues may be substantial, depending upon the community design and organization of the association. This fee is compounded by the umbrella association created to manage, maintain, and operate the common elements and facilities of the entire community.

For the development of individual condominium projects, developers must consider appropriate costs and time for the transition of the ownership and maintenance responsibilities from a developer-controlled association to a homeowner-controlled association. Many transition committees are retaining the services of professionals to assess the quality of those elements to be owned and maintained by the association. Many condominium associations are being transitioned legally and technically.

4.12 Rental or Leased

Large-scale communities should include rental properties as a viable option. If the property is located close to a college or university, rental units may be in short supply. Rental units are generally owned by one entity, which owns the buildings and common areas and includes the operation and maintenance costs in the monthly rental rates. Many retail centers are structured similarly, with space leased on multiple-year contracts. Office and industrial uses typically are leased spaces, but they certainly can be sold as a condominium form of ownership. There are companies specializing in the design, construction, and operation of apartment complexes. With home ownership increasing, the market analysis for rental complexes is very important before the large-scale project allocates property and location to a rental housing project. In traditional neighborhood developments, the relationship of housing and retail and office uses remains an important component of large-scale projects, reinforcing a sense of community. The ownership of the housing units could be rental or condominium, but the mixed-use components integrated within a building structure generally remain under the ownership of the developer of the project.

4.13 Product Description and Attributes

Land-use allocations within the large-scale community-design program should closely mimic the results of the market study. The interior spaces and specialty-design elements are outlined in most market studies. As an example, the market study might define the housing product needed to meet the market demand (e.g., four-bedroom home, two-story colonial with a master on the first floor). The market study would also outline room sizes, distribution of the interior public and private spaces, spatial orientation, square footage, foundation style, and garage sizes. An important statistic in evaluating the sales price of a home is the sales price per square foot. Comparing this pricing statistic within the market region will assist in creating the price points for the residential components within the large-scale project.

There are many elements of a housing product that need to be assessed for design and comparison purposes. The following list of features and characteristics will further define the residential-component approach:
Table 4.1 Housing Design Options

<table>
<thead>
<tr>
<th>Construction</th>
<th>Bedrooms/Baths/Flooring</th>
<th>Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frame or block</td>
<td>Master: up or down</td>
<td>Molding style</td>
</tr>
<tr>
<td>Slab, crawl space, or basement foundation</td>
<td>Split master from the other</td>
<td>Appliances: standard or optional</td>
</tr>
<tr>
<td>1, 2, or 3 stories</td>
<td>bedrooms or adjacent to</td>
<td></td>
</tr>
<tr>
<td>Type of siding</td>
<td>1, 2, 3, 4, or 5 bedrooms</td>
<td></td>
</tr>
<tr>
<td>Type of roofing</td>
<td>Room sizes</td>
<td></td>
</tr>
<tr>
<td>Architectural style</td>
<td>1, 2, 21⁄2, 3, or more bathrooms</td>
<td></td>
</tr>
<tr>
<td>Front- or side-loaded garage (1, 2, or 3 car garages)</td>
<td>Carpet for various rooms</td>
<td></td>
</tr>
<tr>
<td>Orientation of homes, site amenities</td>
<td>Foyer finish; carpet, tile, vinyl, wood</td>
<td></td>
</tr>
<tr>
<td>Fuel: natural gas, propane, electric, geothermal, oil</td>
<td>Kitchen finish: tile, wood, vinyl</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Bath finish; tile, vinyl</td>
<td>Windows, energy conservation</td>
</tr>
</tbody>
</table>

4.14 Community Image and Street-Scene Considerations

To attract buyers and to be set apart from the competition, large-scale multiuse projects require creative design approaches to enhance the visual presentation of the community. The street scene, community attributes, and environs will augment marketing efforts and solidify a sense of community. Themes and concepts are important aspects of project development. These approaches can be interjected in all features of the project design program. Establishing project colors, architectural styles, and practical project materials will provide a cost-effective approach in creating a community image. This image should be something the general public finds memorable. This alone will be a memory point, causing purchasers to remember the project and consider investing. Straying from the design program due to the lack of financial commitment or change in market approach will adversely affect the image of the community. Consistency in the design program, threading all of the elements of the community together, will result in environmental harmony and establish a clear sense of community. The image must be projected from within the residential and nonresidential aspects of the project, and it must resonate with the general public.

Project images can be created by duplicating a harmonious color scheme throughout the hardscape features. Building color schemes and landscaping material can also be complemented by using the community color scheme. The exterior building colors, roof colors, and accent color schemes should complement each building area. Entry features, common-area buildings, and nonresidential buildings should be consistent with the color palette selected for the community. This design element extends to marketing brochures, signage, and logos. The important lesson is to create an image the purchaser will remember and want to see again.

Street scenes created throughout a large-scale project are important components of the land plan and engineering design. Careful consideration should be given to
forcing the eye from overdesigned infrastructure elements to where people will live, work, and relax. All land-plan concepts should be evaluated by traveling at eye level in an enhanced, 3-D (three-dimensional) software program. It is important to see what the driver will see and consider the line of sight once the project is constructed. To focus on street-scene considerations, answer the following questions:

- What are predominante street-scene features?
- Should the roads become more curvilinear to change the street-scene perspective?
- What do you see at intersections—living-room windows, landscaping, or open space?
- What are the typical road sections and hierarchy of road standards for the community?
- Are the houses oriented properly to show the best side of the home?
- How are garage doors addressed in the product design?
- Have open-space areas been strategically located at key vision corridors?
- How has the relationship between the vehicle and the pedestrian been addressed?
- Have site amenities, community buildings, and recreation facilities been centralized?
- Are the nonresidential buildings presented in residential scale?
- How do the entry features, signage, and site monuments foster the overall community-design theme?
- How will mailboxes, electric transformers, cable boxes, streetlights, street signs, and traffic-control signage be handled throughout the project?

The number of housing units and various land uses provides within large-scale projects opportunities to distribute common-area costs, which on a per unit basis can be insignificant. The result, however, will enhance the sales and marketing efforts as well as provide a definite sense of community. A sense of identity and livability will differentiate a large-scale project from the competition and the fragmented residential approach typically seen in growth areas.

### 4.15 Pedestrian and Recreation Design Components

The importance of providing design elements for pedestrian access throughout the community must be stressed and managed within the design team. The transportation of people is as important as providing safe and reliable vehicular movement within the community. The linkage of residential neighborhoods and commercial and retail components also influences the image of the project. Many governmental entities encourage connectivity between uses, but the connections must be practical and should be reasonable approaches to complement the overall design goal. Pedestrian
corridors are typically designed in parallel with vehicle corridors. Certainly, a walkway on one side or both sides of a roadway are typical design standards for residential applications. The sidewalks are generally 4 feet in width and constructed using concrete. For main boulevard routes, consideration should be given to a wider walkway on one side and perhaps a separate bike lane contained within the asphalt roadway. An important concern while planning a large-scale project is to evaluate comprehensively the needs of the people and always to provide a systematic layout of the pedestrian access routes. Pedestrian pathways and trails should be designed in open-space areas adjacent to residential areas that funnel to recreation complexes, active open-space arenas, and commercial and retail complexes. A walkable community is more marketable and as well enhances the sense of community. Proper large-scale project planning and design would consider pedestrians before vehicles.

4.16 Recreational Facilities

Recreation facilities are often constructed based on various design programs. The complexity of the design program is developed from the market-study information and buyer profiles. In a large-scale community, each residential use and market segment may require special analysis of the recreational aspects of each market. Regardless of the market segment, the need for pedestrian connectivity and linkage remains consistent. However, active recreation facilities should closely resemble the demands and needs of the marketplace. The design elements of a recreation facility for active adults should be carefully contemplated and test-marketed. Certainly, the recreation facilities serving the active-adult market will be different from the facilities designed for the first time home-buyer market. Thus, the uses selected for the residential areas will further define the recreational requirements for each area.

As a master developer of a large-scale development, a decision needs to be made on centralization or decentralization of recreation facilities and individual components for common-area uses. Centralizing the amenities, which may include clubhouses, tennis courts, swimming pools, etc, requires more upland area; and the cost to construct, operate, and manage the facility will be the master developer’s. If each housing area is sold to another company, each project may be required to construct their own separate recreation facility. The master developer controls this approach through the covenants and restriction imposed on each project area. This approach would also further limit the upfront financial commitment and the allocation of land into a recreation complex rather than in a salable parcel. However, decentralizing the recreation facilities into each housing area does not preclude the necessity of planning common-area improvements for pedestrians and community image. The approach selected will also impact the construction, operation, and management budgets of the master developer. Other considerations for the amenity package include:

- Location of each amenity for visual impact
- Construction phasing of the recreation facilities
- Selecting design elements and calculating the budget estimates for each
- Expanding the design team members to include: architect, landscape architect, interior designer, irrigation designer, and administrative disciplines

A large-scale community provides the opportunity to plan for a cohesive, sustainable, and user-friendly community design through well-designed recreation amenities and pedestrian pathways, all of which will enhance the marketability of the project over the anticipated build-out period. The initial financial investment for a large-scale project extends beyond the purchase of the land and the design, so master community developers must factor in construction costs associated with the start up of the community. Consideration should be given to the phasing of the recreation amenities and common-area improvements. These elements of the design create the image and enhance market acceptance. However, there is a balance in the financial outlay and what is needed to seed the community.

All buyers want to visualize the image and experience the reality before they purchase. Thus, the entrance presentation including entry features and landscaping combined with the sales area and a limited recreation-amenity package may be sufficient to seed the community. Starting the construction of the initial housing area is essential in creating sales momentum for the project. Design team members must concentrate on these elements for project marketability and budgeted cash flow estimates.

4.17 Golf Course Opportunities

Most large-scale community designs should investigate the benefits of including a golf course in the design program. Not only will a golf course add value to a project but, also, the course may be used for land-development efficiency. A market study will investigate the need and desirability of a golf course in the specific project location. If there is a market for a golf course, the site should be evaluated for potential. The site-analysis work prepared during the due-diligence period will provide the meaningful technical information necessary to assess the viability of a course constructed onsite.

Natural Land Features

The site characteristics identified during the site-analysis work are assessed for golf course-construction problems, cost considerations, and layout issues. Wetland and floodplain areas provide an excellent backdrop to a course layout. The important site characteristics affecting the course design and costs are soils, drainage, vegetation, topography, and existing water features. These site features provide a source of creativity through which the course design is complemented and enhanced.

Land Availability

A basic golf course requires 140 to 160 acres of land in addition to the land needed for a clubhouse, practice facility, and associated infrastructure elements. The land
for these elements will vary depending on the design program, but 20 to 30 acres would not be unreasonable. The golf course provides open space, which may satisfy certain local ordinance provisions. The course would also increase the value of the land designed near the course. Typically, residential uses are land-planned adjacent to the course and typically used for estate or move-up markets. However, higher-density uses should also be considered adjacent to the course.

**Design Team Member**

The vision for the community-design and golf course element will determine the makeup of the design team members. If the intent is to create a signature course and community, the golf course architect selected will have an extensive and impressive portfolio. Many of the PGA tour members also lend their names and talents to the development of signature golf courses. However, there are other golf course architects fully capable of designing a challenging, aesthetically pleasing, and cost-efficient course. A resource for selecting a golf course architect is the American Society of Golf Course Architects (www.golfcourse.org). Other members of the team will include a land planner and civil engineer to balance the concepts and vision into a workable plan.

**Costs and Use**

A basic golf course designed for the everyday player may cost $100,000 to $150,000 per hole. This estimate includes the golf course, cart paths, tees, greens, and associated infrastructure components. There is an additional cost for the clubhouse, practice facility, and associated infrastructure. The cost per hole will vary with the design and designer. The land cost is also separate from this estimate for hard-construction costs. The benefits of the golf course may include:

- Active and passive recreational opportunities.
- Compliance with jurisdictional open-space requirements may be met with a golf course. Thus additional land may not have to be allocated for open space.
- Enhancing property values with views and an association with a golf course community.
- Provides opportunities to control storm-water runoff from residential and nonresidential uses. Lakes and ponds provide an opportunity for a comprehensive storm-water management approach within the golf course. This will benefit the characteristics of the golf course and permit design flexibility in developing the various uses within the large-scale project. The contouring of the fairways provides conveyance opportunities for storm water.
- Grading operations, moving and stockpiling of material, managing top soil, and disposal of unsuitable material in berms provides flexibility during construction, saving time and expense.
Ownership, Operations, and Maintenance

Master developers incorporating a golf course in the project design may consider the various ownership options and assess the operation and maintenance costs associated with the day-to-day functioning of a golf course facility. The golf course ownership could be retained by a master developer who contracts with a reputable golf course–management firm. The master developer could subdivide the layout into a separate parcel, which could be sold to a golf course entity that would be required to design and construct the facility. Alternatively, the master developer could manage the responsibility of designing and permitting the golf course. Once permitted, the course design and property could be sold to another entity. Or the master developer could design, permit, and construct the golf course and obtain memberships prior to selling the facility to another entity. Resolving the ownership issue at the beginning of the project will provide excellent direction to the design team, so it may shape the community layout consistent with the developer’s design program. Golf courses are managed in several ways:

- Private Course: This is a restricted course for members only; privately owned.
- Resort Course: This is a course associated with a destination point or vacation area with lodging.
- Daily Fee: This is a privately owned course that is open to the public with daily green fees for patrons.
- Semiprivate: This is a privately owned course open to the public with private memberships also available.
- Municipal: This is an unrestricted golf course owned by a government entity and open to the public.

Golf courses are a special land use that requires expertise to operate and manage the facility effectively and profitably (see Fig. 4.1). Most master developers do not have the experience operating or managing a golf course. Partnering with a golf course developer at the initial planning of the community would benefit the preparation of alternative land use plans for the property.

4.18 Community and Homeowner Associations

Community Associations

Most large-scale projects are designed with an umbrella community association responsible for the ownership and maintenance of common areas, common recreation facilities, and infrastructure owned by the entire community. All property and/or unit owners within the community pay a monthly fee for this community association. This association typically remains in the control of the master developer until close to the conclusion of the project. The purpose is to maintain aesthetic control of the community to ensure common areas are properly maintained and the architectural
Figure 4.1 Golf Course Land Plan. Allocating sufficient land for a golf course and the cost associated with building, operating, and maintaining the facility may not be sufficient to negate the benefits of having a course land plan. Developers can gain premium lots, visual aesthetics, open-space value, earthwork balancing, and comprehensive storm-water management facilities. All of which will enhance the value of the land-use pods and project profitability.

integrity of the community remains intact. This is especially important to control retail leases and uses of buildings. This control goes beyond government oversight into maintaining the value of the community. Although certain uses may be permitted by local zoning ordinances, the community association may screen the uses to ensure compatibility within the retail community or to encourage the establishment of a use needed to complement the existing retail offered.

Homeowner Associations

As various land-use parcels are identified, the master developer will create covenants and restrictions for each use. Residential projects may also have common areas and satellite recreation facilities that would be owned and maintained by each individual homeowners association. These associations are created and registered by
each residential developer and controlled by that developer until at least 50 percent of the housing units have been sold and closed. In some states, the associations must be registered with local or state agencies, and the HOA (Homeowner Association) documents must comply with and adhere to the rules and regulations governing associations in that specific state. Homeowner Associations are governed by the residents, who typically hire a management firm for the administrative duties and to ensure the regulatory compliance of the association. The fee for individual associations will vary, but they are typically less per month than already charged for membership to the community association.

4.19 Project Themes and Architectural Controls

Large-scale projects should have a sense of identity that will be reinforced through marketing campaigns, sales literature, and the construction of common design elements (see Fig. 4.2). Special attention is given to the creation of an identity that relates to a unique characteristic of the land, a historic significance of the area, or a

Figure 4.2 Project Identities. All residential and nonresidential uses should comply with the overall architectural design program developed for the project. Building architecture, material usage, and use of color provide project identities. A common design thread will sustain a sense of community and enhance property values.
vision conveyed by the master developer. For example, an 1,800-unit project in New Jersey required less time to obtain approval for the entire project than it took to agree on a project theme and image. A charcoal mill once operated on the property, and it was decided that this image would be developed into a project theme. The project was called “The Villages of Charcoal Mill.” Each housing area was named consistent with the overall theme and street names where established to further expand the image. The entry feature was a true-to-scale charcoal mill. The site features were selected to represent the time period, and all sales paraphernalia complemented the theme. These images were memorable, differentiating this project from the competition.

Overall, community-design approaches, especially nonresidential uses, must be controlled and managed for compatibility with the community-design program. The architectural control of building design and site features maintains values, and the visual impact is noticeable. The master developer establishes the rules and regulations of the community under development. It is important to set control of (but not to overly control) the architectural design of buildings within the community. The sustainability of the community is directly related to the sense of pride in the

Figure 4.3 Site Features. Memory points are projected in various ways. Designing site features for marketing purposes also establishes a sense of identity and belonging at reasonable expenditure levels.
community. This can be achieved by controlling the design and construction of buildings within the community. Thus, property values are maintained and people will want to be part of a community pleasing to the senses. Master developers must focus on creating the standards on which the community is based very early in the design process (see Fig. 4.3).

**4.20 Summary**

Not only will builders and developers continue to offer projects for specific markets, but communities will also cooperate in the competition for businesses and home buyers by attracting growth to sustain a community identity. Master developers must have the pulse of the market but also search for well-located, below market-priced land for large-scale developments. Work and home lifestyle opportunities, community aesthetics and connectivity, and property value controls are elements of choice for a discerning public categorized in every population and economic market segment. Large-scale projects offer options, alternatives, and opportunities for builder-developers to successfully design and construct a profitable project.

**DISCUSSION TOPICS**

1. Is there a relationship between the sales price of a home and the cost to develop the land and construct that home?
2. In a large-scale project, would you build residential or nonresidential uses first and why?
3. How can you assess the validity of the market-study conclusions?
4. For a large-scale project with multiple-year build-out projections, what are the best ways to hedge against market shifts or downturns?
Land-Use Concepts

5.1 Introduction

Large-scale projects are created by a design team assembled and managed by a master developer. The project vision, concept, and design program are illustrated through distributing land use throughout the entire property boundaries. Selecting land uses and patterns of development are a result of analyzing the site-analysis information, understanding base-map illustrative layers, and visionary debate with the design team. The relationship between the various residential land uses and their interaction with nonresidential land uses provides a sense of community. It also provides a sense of scale for marketplace acceptance and understanding. In preparing land-use plans, the design team is best qualified to develop a functioning plan to meet a developer’s vision for the project.

The preparation of land-use plans is a creative painting of ideas into a structured pattern for developing a sustainable living and working environment. Creativity is boundless in land planning and land-use distribution. All factors of known origin, such as soil characteristics and topography, enveloped in a marketing crystal ball provide countless land-plan variations, all of which could be marketable and successful. To reach a conclusion, the master developer must factor in costs, land absorption, and government oversight.

Balancing vision and concepts with practicalities is the primary mission of a master developer. It is not wise to think, “if you build it, they will come.” However, it is useful to ask: “if you plan it, will they come?” In essence, the use of marketing studies and tools of the trade will remove some guesswork while entrepreneurial instincts guide the land-use relationships and, thus, create a community. This chapter identifies land-use options available for large-scale developments. Each use is described in detail on how the land-use jigsaw puzzle pieces fit in the overall layout.
5.2 Land-Use Diversification and Absorption

A developer of a traditional, single-family subdivision must assess the planned timeline in which to design, permit, construct, and sell lots to builders. This timetable and the rate in which lots are purchased affect the cash-flow analysis for the project. If the rate in which lots are purchased increases faster than projected, the profitability of the project will increase. If all lots within a traditional, single-family subdivision are essentially the same, factoring out locations, price increases, and premiums, the rate in which the lots are sold can be predicted with some certainty. This is true, especially in a consistent housing market with defined price points. In comparison to a large-scale project, a developer of a single-family subdivision sells lots while the master developer sells property with various land uses associated with specific parcels. The uses and product for specific parcels will attract builders specializing in building and selling a specific use. The greater land-use diversification, the greater the potential of absorbing the land quicker and accelerating the timetable to complete the job is enhanced.

Phasing of different land uses will distribute land so the developer can better manage the absorption rate and cash-flow requirements. The diversification of land uses and firms specializing in specific product lines should be a consideration when the land-use plan is prepared. Although the market study will identify uses and price points for each use, the report will not necessarily identify the builder-developer of each specific use. As an example, a traditional, single-family housing product may not be the same building company as the firm purchasing the higher-density land use slated for midrise condominiums. Thus, the master developer needs to identify the end users for each market segment. In preparing the master plan, the diversification of the land uses phased in the project for management of the absorption rate and cash flow will benefit the master developer in their pursuit of a successful project.

5.3 Residential Market Overview

The residential market has significantly changed over time to reveal larger homes being sold on smaller lots. The median price point of the residential market has increased from year to year. The marketplace is striving for move-up homes, while the developers are striving for higher density with smaller lots. The design program for residential uses in a large-scale projects must mirror the market study but be tempered with the trends in housing developments. Diversification within the residential land-use components is also an important planning tool for phasing and allocating different pricing levels for houses throughout the community.

Most municipal governments define residential-zoning classifications based on lot size, minimum bulk requirements, or the total number of dwellings per acre (density). In most ordinances, density is calculated on the gross total area of a parcel. In land planning, one of the most important calculations is determining the net buildable area. The market, product selection, parcel size, net buildable area, and density permitted are all factors in achieving the maximum number of housing units on a specific parcel.
In many jurisdictions, the density assigned per residential land use will be defined as a range. As the master developer establishes the diversification of residential land uses in the project, he or she should also establish ranges for flexibility in design. Assessing the difference from density based on gross acreage versus a net, the net buildable area will result in different design approaches and anticipated dwelling-unit counts. The gross acreage and density for a land-use area will also establish the value for the specific property.

As an example, a 200 acre (gross) parcel at a density of 8 dwelling units per acre with the following features and details:

- 1,600 units permitted on this property
- Market: active adult
- Product: one-story, single-family detached houses
- 100 acres of wetlands: net buildable area is 100 acres
- Density would be 16 dwelling units per acre to achieve the same number of units based on the gross area of the site.

Achieving 16 units per acre would require a change in the product from a one-story, single-family house to a two-story, walk-up condominium. The market study indicates that the market is for a single-family, detached, fee simple product. The result is a maximum of 800 units, based on net buildable area, however:

- 100 acres is not the net–net buildable area. Road right-of-way, detention facilities, and other deductions, including open space or easements, etc., should be deducted. For example:

  100 acres   net buildable area
  (20 acres) road right-of-way (20%–25%)
  (10 acres) detention facilities (10%)
  (5 acres)  other deductions including easements, parcel configuration adjustments, open space, amenities, etc. (5%)

  65 acres   net–net buildable area

Using a lot size of 50 feet wide and 100 feet deep (or 5,000 sq ft) would equate to approximately 8 units (dwelling units, or DUs) per acre, net. Total number of housing units expected is 65 acres × 8 DUs / acre = 520 units

- If the raw land cost for agricultural or low-density residential land was $25,000 per gross acre or $5,000,000. Based on a density of 8 DUs per acre for 200 acres or 1,600 units, the raw land per unit cost would be $3,125.

- However, the raw land price per unit is $9,615, with a net–net yield of 520 units.

The land price per dwelling unit may be unacceptable to the buyer due to market considerations. In a large-scale development, the master developer may increase the
value of each land-use area by configuring the property lines conducive to efficient land planning and regionalizing storm-water management facilities. Environmentally sensitive areas would also be platted outside of the individual parcels. Thus the net buildable area can closely mirror the gross area of the property, resulting in higher land values. As an example:

- 100 acres = buildable area within a land-use parcel
- 20 acres = road right-of-way (20%–25%)
- 1 acre = other deductions for site specific amenities, etc. (1%)
- 79 acres = net–net buildable area

Using a lot size of 50 feet wide and 100 feet deep (or 5,000 sq ft) would equate to approximately 8 units (DUs) per acre, net.

Total number of housing units expected is 79 net acres × 8 DUs / acre = 632 units.

- If the raw land cost for a zoned parcel with a density of 8 units per acre was $50,000 per gross acre or $5,000,000. Based on a density of 8 DUs per acre for 100 acres or 800 units, the raw land per unit cost would be $6,250.

- However, the zoned land price per unit is $7,911 for a net–net yield of 632 units.

This example is a basic analysis of yield, pricing, and the benefits of a well-planned, large-scale development. The master developer would achieve the same value for the land and enhance the value of the property through master planning. The individual land-use area purchased by a builder-developer would result in more units at a lower per unit cost for the land. There are other factors in the various residential uses and the following bulk requirements are typically created for residential zones.

### 5.4 Zoning Bulk-Requirement Definitions

**Bulk requirements** are constraints imposed on residential lots to control the building practices and ensure consistency within residential zones. As the residential zones vary in density, the lot size will be the controlling factor in the establishing the building envelope. As lots increase in size, the bulk requirements will also increase to achieve a sense of scale within the lot and between adjacent lots. As residential densities increase and the trend of larger homes on smaller lots continues, the sense of scale and the street scene become imbalanced. The master developer can control these factors through covenants and restrictions imposed for each residential use. Maintaining residential values through proper planning, distribution of land uses, and strategic covenants and restrictions will ultimately result in a destination that attracts buyers.

The following residential classifications are typical categories, and market segments have been added to each category for further understanding of each housing use.
5.5 Rural Residential

Rural residential use includes lot sizes exceeding one acre. The rural designation is intended to promote large lots, preserving and massing the open characteristics of the property not conducive to higher-density uses. The areas consolidated into large lots could be steep slopes, floodplains, or environmentally sensitive areas that are not included in dedicated open-space areas. Rural lots are not typically associated with large-scale master-planned communities but are generally located in areas well beyond public services. Infrastructure design standards are also modified to correspond with low-density and wide lot-width developments.

Rural residential lots also have wide lot widths in order to be in scale with the lot size (see Fig. 5.1). It is not uncommon for a rural residential zone to have lots 200 feet wide. This causes the infrastructure costs to increase substantially, unless regulatory concessions are made. In rural residential subdivisions, eliminating curb and sidewalk and reducing pavement widths are practical approaches to serving large-lot subdivisions.

Figure 5.1 Rural Residential. Single-family lots exceeding one acre in size are termed rural residential lots. In a large-scale project, lots could be larger by encompassing deed-restricted land, such as floodplains or wetlands, into the lot area. This would help reduce common-area property and achieve a market niche. Land-development costs may be reduced with less road pavement width and without sidewalks and curbs.
5.6 Estate Residential

Large-scale development will typically include an estate area, better known as the housing status symbol of the community. Homes typically are at the higher end of the market, and the builder is typically a custom home builder with experience in “one of a kind” home design and architectural presentation. To sustain exclusivity, the estate section is limited in the number of lots. Also, the absorption rate of the lots and/or homes in the estate area is not a significant factor; however, the estate area is an important aspect of the overall success of the large-scale project.

The lot size remains comparable to the price points of the homes and may range from 0.5 to 1.0 unit per acre. The lot width also remains substantial to promote wider houses on wider lots. Side-entry garage entrances and circular drives can be accommodated on estate lots. Estate-lot widths vary from 100 to 150 feet. Infrastructure standards may be reduced to encourage traffic calming and discourage through traffic (see Fig. 5.2). The roadways may also be designed as private roads for site-design flexibility, which may include security gates, guard houses, privacy walls, and specialty pavement. In preparing the land-use plan, the estate-lot area should be

Figure 5.2 Estate Housing. Balanced housing opportunities within a project will achieve market segmentation and increase absorption rates. Estate housing will have the highest selling prices, achieving the lowest absorption rate with the highest returns. Although wide lots increase land-development costs, the estate-housing price ranges adequately overcome the added cost.
located in an area that promotes exclusivity, and due consideration should be given to land uses on adjacent parcels.

### 5.7 Low-Density Residential

This residential segment provides the greatest range of product price points and can accommodate the first-time home buyer to the move-up market. The lot size may vary from half-acre lots to 4 units per acre. The lot size for 4 units per acre is typically 10,000 square feet. The lot width of a low-density residential area will also vary and be determined by the builder of each area. The master developer should establish covenants and restrictions to ensure diversification of price points and product availability between each housing area.

Low-density lots will have lot widths varying from 80 to 100 feet. The 80-foot lots will force more front-loaded garages and the 100-foot-lot widths will permit side-entry garages. This alone will alter the street scene and provide alternative housing opportunities within the community. Low-density developments can be viewed as traditional, single-family-housing subdivisions (see Fig. 5.3). Most builders

![Figure 5.3 Low-Density Residential](image)

*Figure 5.3 Low-Density Residential. Based upon the lot width and lot area, this land use provides the greatest flexibility in product design and price points. This residential application has the greatest market depth. Also, land-development costs per unit may be a lower percentage of the sales price per unit and may increase profitability.*
prefer standard single-family subdivisions with wide market appeal to further minimize the risk and maximize the rate of return. In a large-scale community, a master developer may be taking more of a risk by allocating land to niche markets and housing types. This of course is contingent upon the site location, marketability, and design program established for the community. Selecting low-density residential uses for distribution throughout the community will provide market stability and establish a residential price point baseline for the project. This use is also flexible in its association with other adjacent land uses.

5.8 Low-Medium Density Residential

As the density and intensity of use increases, the housing product begins to control the site layout and design. As master developer, the configuration of the parcel with higher densities should take on a form consistent with the topography and ease of development. Low-medium density, single-family lots will vary from 4 units per acre to 8 units per acre. (See Fig. 5.4). The lot areas will vary from 10,000 square feet to
4,500 square feet, which is a 50-foot-by-90-foot lot. The quarter-acre lot will be a more traditional housing approach.

If the lot becomes smaller and the lot width narrower, the housing product will start to shift from a wide but shallow house to a narrow and deep house. With zoning regulations and building-code criteria for building separation and side-yard setbacks, the width of a house on a 50-foot-lot width could be 38 feet in width. This would necessitate architectural controls on garage placements and dictate varying front-yard setbacks from lot to lot. Other effective restrictions to improve the street scene could be controlling the architectural designs on adjacent lots as well as lots across the street so that the elevations do not look alike. The material selection and color scheme may also be dictated on a preplanned basis. All of these precautions will maintain an aesthetic street scene and provide a sense of individuality and community.

The small, single-family lots typically are included in a homeowners association. The larger lots in this density classification are included in a fee simple subdivision without a homeowners association. Without an association, the master developer may provide covenants and restrictions on the land to control homeowner modifications to their homes, adding accessory uses, i.e. sheds, and proposing other lot improvements. This land-use range is also suitable for a neotraditional land-planning approach.

5.9 Medium–High Density Residential

The building design becomes the key elements in the land planning of a medium-high density project. This land-use category provides a transition to an adjacent nonresidential use. The association between the nonresidential use and medium-high density uses becomes more important to control vehicular and pedestrian accessibility.

This land use has densities ranging from 9 units per acre to 18 units per acre. The 8 to 12 units per acre range will be duplexes, townhouses, back-to-back townhouses, and cluster housing. The townhouse product may be on fee simple lots or a condominium project. The attached units will vary in width and depth and may be single-story- or multistory-townhouse units, depending on the market. The townhouse buildings will consist of several units together, creating a building cluster. The number of units will vary depending on the floor-plan options but also based on the site layout. The maximum number of units in a cluster may be established by local regulations, or the builder may limit the number of buildings for construction efficiency.

Also, attached townhouses may have remote carports or garages, attached garages, or parking lot facilities. The building design and the arrangement of the building clusters on the site are important design considerations, especially for project marketability.

Higher-density projects provide greater opportunities for open space and recreation elements (see Fig. 5.5). Amenity packages, landscaping, and entry features become essential site-design elements to “soften” the density of the site. For this land-use category, often the builder of a townhouse project will be a different entity than the builder of a multi-story condominium building. As the density increases from 12 to 18 dwelling units per acre, the housing product will change. In this category, the housing product will be designed as a vertical product from a two-story walk-up
Figure 5.5 Medium-High Density Product. Densities ranging from 8 to 12 units per acre can be achieved with attached units. Attached-unit projects are planned based upon the building size and configuration and less on land characteristics. Common areas increase and ownership mechanisms change.

building to a multistory building with elevators. With this density, the unit ownership will change from fee simple to condominium ownership, or it will be a rental project. In large-scale projects, an in-depth market analysis must be made to determine the depth and extent of the market for a multistory housing product. A preferable planning approach may include residential uses constructed over retail uses. This would provide higher densities, connectivity, and sustainability.

5.10 High-Density Residential

High-density residential areas are classified as multifamily residential. This category would include traditional garden apartments, two-story walk-up buildings, and mid- and high-rise buildings. High-density residential will typically exceed 18 dwelling units per acre. High-rise buildings will exceed many design parameters established for a well-planned, large-scale project. It is important to assess the need for a high-density land use that would necessitate a multistory building. The location, market, and
High-Density Residential

Figure 5.6 High Density. Multistory-residential buildings are suitable for mixed use and live-work applications. This land use is more compatible with nonresidential uses. High-density housing located at town centers and transportation corridors strengthens the concept of sustainability.

political environment will affect the success of a high-density residential use in the master plan (see Fig. 5.6). A large-scale community plan should not include densities for the sake of providing unit count.

The planning concept of large-scale developments is to create a sense of community by providing complementary land uses designed in residential scale. Higher density in many jurisdictions is considered a bad planning concept. However, if designed in scale, high-density residential uses provide an important component to the overall master plan. High-density residential areas will complete the price-point spectrum while promoting open-space development. High-density uses in a large-scale project do not have the same connotation as high-density residential projects in an urban environment. The planning approach may very well be the same, but the results will be different, because high-density uses will be properly planned for within a large-scale project and not considered stand alone projects.

Multistory-building projects will be designed with traditional parking lots and access drives. Depending on the topography, a building design could incorporate the parking under the building, which would provide more open-space opportunities
but significantly increase the building cost. Recreation facilities, meeting places, connectivity to nonresidential uses, and mass transit availability can be integral to a high-density project.

5.11 Mixed-Use Developments

Large-scale projects are forums for well-designed and visionary communities that complement various adjacent uses. Mixing uses is not new and not uncommon. In new community design, a master developer has the opportunity to brand a project through well-designed integrated uses. A sustainable design approach is mixing residential, office, and commercial uses together or combining the uses into a town-center plan. Well-designed, mixed-use developments will provide architectural integration and pedestrian connectivity between land uses. Mixed uses may be an acceptable alternative to increasing density. Many mixed-use plans are identified as transit-oriented projects, neotraditional, or traditional neighborhood developments. These planning approaches present the mixed-use development theme, enhancing the marketability of the project. Many mixed-use developments have been classified as either sustainable, new urbanism, or smart-growth communities. Many local zoning ordinances do not have mixed-use criteria. Large-scale community plans, then, provide a means to the end. A well-designed and integrated mixed-use project supplementing the other uses within the community will be welcomed by local planning officials. The result of comprehensive-design planning is well received over spot-subdivision developments without interconnection of design ideas and planning principals. Within each mixed-use category, the intent is to permit flexibility and allow uses meeting the needs of the community and to provide a destination for visitors, workers, and home owners.

5.12 Residential Mixed Use

A combination of residential, retail, and office uses provides intensities, appropriate scale, and architectural compatibility, resulting in creative environments that attract the market. In this mixed-use category, residential dwellings will be the predominate use (see Fig. 5.7). The office or retail components will be incorporated within the same structure(s) as the residential and will be compatible with the residential use. The integration of these uses may be horizontal or vertical. For vertical applications, the architectural approach should be cognizant of the building scale and the integral interaction between the uses. This approach can also be a transitional use between higher-density residential uses and stand-alone office or retail uses. This is a traditional land-use-planning approach, one that is time proven. However, mixed-use projects can also be isolated and not linked directly with other commercial or residential components. The linkage is provided through vehicular and pedestrian planning and facilities. The concept of providing retail space integrated or connected to the residential use becomes pedestrian friendly. The results are positive for the home buyers and the retail providers.
5.13 Commercial Mixed Use

Similar to a residential mixed use, in this category commercial and retail uses would dominate the use mix. The residential use is ancillary to the commercial components and would provide different price points for condominium and townhouse units, thereby providing housing diversity within the large-scale project. Incorporated into a large-scale project, this use would typically be a transitional use linked to high-density residential and neighborhood commercial uses. A project of this composition would ideally be located adjacent to or close to the town or core center of the community. It permits design flexibility from use to use, while providing a transition from high-intensity uses to the various residential categories.

5.14 Office Mixed Use

An office mixed-use project would combine residential, retail, and offices uses. Office use would predominate, supported by a variety of other uses with a traditional or common relationship of use. The location of a mixed-use office complex would typically be
near main access roads and transportation links to and from the community or along the fringes of the center core area of the community. A mixed-use project with office, retail, and services with higher-density residential uses can be the central component of a neighborhood or village within the large-scale project. It essentially centralizes the living and working relationships into defined areas. A neighborhood business center is complemented with service companies, retail commercial, and residential use for employment and living environments designed at a neighborhood or residential scale. This approach has also been labeled as a work-live use.

5.15 Village or Town Center

This use is the essence of a large-scale community, providing a mix of residential housing types and mixing destination uses while creating the central focus for the village or town center component of the project. The village or town center approach is not intended to be a regional solution to providing office, retail, or other professional uses. The village and town center concept will mix residential, retail, office, and professional uses into a well-designed destination component enhanced through residential-scale architecture and softscape and hardscape features. All within a well conceptualized large-scale development, master developers may mix uses—e.g., supermarkets, drug stores, restaurants, lodging, services, offices, and recreation components—promoting daytime and nighttime activities. The mix of uses must be based in need as outlined in the market study. The residential aspect will typically be medium-high density and high-density housing alternatives. Developing a town-center concept consistent with the project theme provides a sense of community. The master developer should allocate sufficient design planning and funding to prepare a central community focus. Each large-scale project will have a location, theme, or market need that should be exploited in creating a sense of belonging. A transportation link (such as commuter rail), recreational needs, or specialty retail stores may be identified as the key ingredient in which a village- or town-center design is based. The master developer would typically rely on the planner, marketing specialist, real estate agent, architect, landscape architect, and a public relations firm for input. The need to ensure a cohesive environment for office, retail, and residential uses in a village- or town-center area is tantamount to a successful project.

5.16 Neighborhood Commercial Retail

Development areas defined as neighborhoods within a large-scale project will benefit from having small neighborhood-oriented retail, services, and office complexes integrated into each defined neighborhood. The uses permitted in this category would define how neighborhood commercial–retail use will function with surrounding uses. A neighborhood commercial–retail center should be conveniently located to serve a segment of the large-scale project. These centers are generally low-intensity uses catered to the conveniences serving the residential areas. It is important to situate the
neighborhood centers so that they are convenient to surrounding residential areas and are accessible by vehicles and pedestrians. Pedestrian corridors connecting residential areas to neighborhood commercial centers are also sustainable-design elements. The centers should be designed in residential scale and compatible with the surrounding uses. Neighborhood commercial–retail centers are mixed-use projects containing offices for local service firms—i.e., accounting or legal—and retail commercial stores. The building design, site layout, landscaping, signage, and lighting characteristics should complement the overall community-design characteristics. Neighborhood commercial–retail centers are conveniences only a large-scale planned community can provide. Rather than a piecemeal approach, disconnected from the surrounding uses, a master developer may cater to the market appeal of the project by providing destination points of interest, restaurants, office space, and retail shops of scale and size directly related to the adjacent residential uses. Most neighborhood centers are designed to serve a limited area. A good example of village planning with neighborhood centers is Columbia, Maryland.

5.17 High-Intensity Commercial Retail

This category classifies land for regional-sized commercial centers as a destination location for a widespread area beyond the limits of a large-scale project. There may be a need for this use in the region, and a master developer may decide to incorporate large-scale office complexes and high-density residential components into the project plan. The project-site location, acreage, market depth, and population will have a direct bearing on the need for a regional high-intensity commercial use. This use is a destination location for an entire region and not for the confines of a large-scale project. Big-box projects and large stand-alone shopping areas are high-intensity commercial retail uses.

5.18 New Urbanism

Large-scale developments are well conceptualized, architecturally appealing, and planned specifically for the pedestrian. Selecting various uses within the project provide cohesiveness, meeting market demands. Design flexibility and the subdivision of uses for different end users permits the master developer to manage better the project timeline and adhere to budget forecasts. Within a large-scale project, a developer may select a new urbanism approach for a portion of the project. To develop a well-planned community, a master developer need not be in competition with new urbanism projects to be successful. In fact, new urbanism requires substantial financial backing and long-term commitments that are realized by only a few developers. A successful project does not have to be based on a specialized concept but should at least have compatible uses threaded together by design and scaled with an ultimate sense of community. A new urbanism neighborhood can easily be a portion of rather than the sole planning concept for a large-scale project. However, many planners consider a new urbanism approach as the creation of a new town with all of the traditions of a town.
from the turn of the century. Only a handful of developers can sustain such a vision. Most large-scale communities will include a variety of uses, including new urbanism or neotraditional planning concepts, as one component of many offered in the project.

New urbanism as well as a master-planned community with various land uses requires local political support. Typically, local zoning ordinances and plans do not provide the design flexibility required for master plans and new urbanism–type projects. New urbanism, as a use, does provide an option for the master developer. In essence, the land allocated for a new urbanism project would contain guidelines for a subset of various uses, including residential, commercial, and office. New urbanism has been referred to as neotraditional or traditional neighborhood development. The concept is to promote a sense of community by planning for people to live and work in the same neighborhood. In certain instances, this marketing approach will be accepted by some but not all. By including a new urbanism use, the concept will market the community image. There are planning concepts that should be considered in any master-planned community. The following concepts are the foundation on which new urbanism has gained momentum in the planning community and has been

Figure 5.8 New Urbanism. A reflection of traditional neighborhood developments having pedestrian-friendly street scenes, minimized front-yard setbacks, and narrow tree-lined streets, new urbanism emphasizes community interaction and de-emphasizes vehicle movement.
embraced by many local jurisdictions. These concepts are valid design approaches for inclusion in a large-scale project design program:

- De-emphasize vehicle movement and provide pedestrian linkage to all uses
- Revise infrastructure design standards to encourage traffic calming
- Plan for residential, commercial retail, and office mixed uses
- Plan for a diversity in housing opportunities, including workforce housing
- Provide employment opportunities
- Strategically locate open-space areas for community parks
- Provide a road network interconnecting uses within the overall community
- Develop a sense of community within each mixed-use neighborhood
- Encourage architectural consistency within mixed use projects

New urbanism, traditional neighborhood developments, and neotraditional projects are a microcosm of a large-scale development planned and designed for a diversity of housing and economic opportunities (see Figs. 5.8, 5.9, and 5.10).

Figure 5.9 Pedestrian Corridors. A well-designed traditional neighborhood plan accommodates pedestrian movement beyond the standard street-sidewalk plan. The interconnection of residential and nonresidential uses is through pedestrian linkage rather than requiring residents to drive to a destination.
This planning approach is not an answer to a niche market, but it has received significant recognition in the development and regulatory arenas. Where jurisdictions embrace the design concept, projects can be economically feasible and have wide market appeal. However, in many jurisdictions, there is a trend toward overdesigning roads based on ease of access, maintenance, and accessibility by life-safety equipment. There is a balance that must be pursued by design team members in presenting this land-use concept. There are a multitude of examples where new urbanism works with the need to protect the health, safety, and welfare of the citizens with practical and economical infrastructure design. Celebration, Florida, is an excellent example of the new urbanism land-use concept.

5.19 Corporate Industrial Parks

As with any use, selecting a special use requires substantial marketing data supporting such a use. In a large-scale project there is an opportunity to establish a more
centralized and long-term tax-rate benefit to the community by creating a corporate park for industrial-type users. These users can be limited in what they can manufacture or produce within the park. As an example, the industrial use could prohibit heavy manufacturing or environmentally questionable uses. By creating a theme as well as architectural and landscaping controls, the corporate users will want to be a part of an attractive industrial complex. A design thread must be woven through all of the uses within the project. Paying attention to the details, even in an industrial complex, is important to attracting users. The master developer may choose to design and construct the infrastructure while marketing and selling the individual parcels to users. Design flexibility is important in attracting various uses. Local municipalities will welcome an industrial park-use project, since it provides an employment base and a diversified workforce for the community.

Establishing architectural criteria will prescribe how the industrial users will develop their individual parcels. Materials, facade design, and use of glass and building orientation on the site will create a standard of excellence. Most industrial users will adhere to design criteria, as long as the master developer does not make concessions in the community-design program. Location of entrance access points should be controlled to improve the street scene along the main collector road. Other design elements that need to be addressed are loading-dock and dumpster-pad locations, exterior building lighting, and parking lot-lighting standards. Attention to detail will maintain value and enhance marketing efforts. Signage must also be considered by the master developer. The size of the identification sign, sign location, sign materials, and lighting are all important details to establish uniformity in design and presentation. The framework should provide individuality and uniqueness for each user but establish a limitation on creativity that may detract from the overall industrial park-design program.

The master developer will typically experience slow absorption rates for industrial-zoned parcels. Phasing infrastructure will manage the project cash flow. The developer can also increase the value of individual parcels by centralizing storm-water management facilities designed to accommodate the industrial uses and anticipated impervious-surface coverage. Centralizing storm-water management and best management-practices facilities will allow the individual industrial users flexibility in site planning, permitting more usable area within each parcel. Maximizing the net buildable area increases the value of the property. Parcel configuration is also typically overlooked in designing an industrial park. Typically, light industrial use-type buildings are rectangular and wide to the street, allowing parking in the front with access roads on either side of the building. Loading-dock areas would be located behind the building and shielded from the street. The parcel configuration should be uniform in dimensions so a typical layout of an industrial use can be achieved economically. This will assist in marketing the parcels and attract successful industrial users.

5.20 Industrial Flex-Space Developments

With a diversification in housing, commercial, and office uses, large-scale projects need to plan for service-industry-oriented businesses. These firms can be small to
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mid size and at times can be home based. However, in a community governed and managed by the community, restrictions will most likely be imposed on the type of home-based business permitted in residential area. Many service-industry businesses would not require storefront or Class A lease space, and a master developer should plan for flex-space developments designed for small businesses. These spaces can vary in size, and the buildings are designed for tenant flexibility and use. The idea of flex space for small service-industry businesses is to relocate this important use from a residential area to an industrial area with the same architectural and signage controls prevalent in the entire community. The flex space may also have loading-dock facilities available for various uses. The flex-space building may also be designed specifically for contractors. For contractors, flex space may be preplanned to include an office space and a warehouse component for storage and limited manufacturing. This flex space may be leased or sold as a condominium unit. Ownership of the space encourages longevity, and the contractors become business owners in a community.

Many flex-space buildings sold as condominiums are two-story spaces, with storage or warehouse space on the first floor and office space on the second floor (see Fig. 5.11). As with any use, the site-design criteria must be established by the master developer to ensure compatibility with other adjacent uses. It would not be

**Figure 5.11** Flex-Space Buildings. Office, business, and light-industrial uses designed in flex-space designed buildings can expand and manage leased space for specific users. Local zoning ordinances should concentrate on providing design and use flexibility in nonresidentially zoned areas.
uncommon to locate this use closer to the residential components rather than to locate it in a remote area of the community. The centralization of this use will further limit vehicle-trip counts and manage the transportation flow throughout the community. Professional service companies—i.e. engineering, surveying, and architecture—also seek flex-space options, since high-profile locations are not required in the marketing of their services. Multiple flex-space buildings located in a planned industrial park setting will provide office-space infrastructure complementing office-building complexes intended for single users or multiple users also located in the proposed project.

5.21 Recreation Areas and Open-Space Uses

Most existing communities have evaluated their needs for future recreation uses and open-space areas. Unfortunately, most of these areas are not located in an efficient, practical, and logical location that is easily accessed by residential areas. However, in a large-scale community design, the master developer will partner with local political officials and with design team members in preparing a reasonable master plan for various recreational uses, both active and passive. An initial planning concept stems from assessing the needs and capabilities of integrating recreation uses with pedestrian linkage throughout the project. Walking trails, bicycle or jogging paths, or sidewalks along the roads are options in pedestrian connectivity. A concerted effort should be made to include this element of design into the land plan from the beginning.

The need to meet the recreational needs of the marketplace is important to achieve a successful presentation of the project. The cost to achieve this design element is not significant and can be considered a perceived value. Creating a community lifestyle and achieving consumer acceptance of recreational opportunities is a standard to be met by all communities existing or newly planned. It is incumbent upon the private and public sectors to achieve a development balance incorporating open-space amenities as passive and active recreational area and providing activities benefiting the large-scale project and surrounding residential areas.

There are a multitude of active-recreation components from tot lots (or children’s playgrounds) to golf courses. The market study should also evaluate different age groups and family demographics to identify the specific design elements of the planned recreation use. At a minimum, a large field area for organized sports activities and a centralized pool—clubhouse facilities should be considered for the entire community. Each residential area could contain satellite recreational areas germane to the market segment. In first-time home buyer and move-up markets, the recreation facilities should be designed for families with children. An estate or active adult community would be designed differently. In these cases, it would be conceivable to have different recreation facilities designed for various user groups within each housing area. An adult amenity may include tennis courts, spa, pool table, jogging or running track, outside heated pool, and craft rooms. In the same project, this facility may be complemented with a family-oriented recreation facility designed with a wading pool, tot lot (or child’s playground), and picnic area and meeting rooms for parties and family gatherings. Each recreational approach has a
cost and has market appeal. The master developer should evaluate the community design as a whole and assign recreational needs for each residential component. Uses such as industrial or commercial may be linked to the other uses with a pedestrian pathway system. Each nonresidential area may also have rest areas and strategically located open-space areas designed to soften the streetscape and provide a more residential-scale design. Channeling walkways to a town center with a central open-space area for events and activities would be a marketing benefit and enjoyed by all (see Fig. 5.12).

5.22 Public and Quasi-Public Components

A large-scale project with mixed uses may impact public services by exceeding their capacity to provide services or overextend their existing capabilities. Local municipalities may require or request a parcel dedicated to public services. In some instances, the property may be allocated for a fire station, police station, utility facility, first-aid station, public-works yard or similar use. This use classification is a result of the private development entity working in concert with the needs of the jurisdiction. Other uses advantageous to the marketability of a community would be a library,
public school, government offices, municipal building, or government facilities. Not all public or quasi-public uses require substantial land set-asides. During the land-use planning phase, the master developer and design team should discuss the needs of the public sector and assess their ability to assist in meeting those community needs.

5.23 Other Uses

In a large-scale project, a master developer may consider other uses including:

- **Amenity sites**: gathering places, gardens, town centers
- **Recreation areas**: tot lots (or children’s playgrounds), community pools, sport fields
- **Community uses**: parks, group gardens, trails, pathways
- **Watercourses**: rivers and streams for enjoyment of all
- **Floodplains**: large areas of land not inundated with water but left as open space
- **Wetlands or other environmentally sensitive land**: restricted for use and activity
- **Civic and religious uses**: private organizations, churches, nonprofit groups

5.24 Summary

As a master developer of a large-scale community, it is extremely important to focus on the conclusions of the market study, capitalize on the attributes of the physical characteristics of the site, and manage the entitlement process in a timely and cost-effective manner. Approaching the project with these goals prioritized, the master developer will likely select land uses acceptable to the main stream rather than seek innovation or unique, untried development concepts. It is desirable to be a leader and not necessarily a pioneer in the development business. However, the proper selection of land uses and their relationship to existing and proposed uses is not a function of traditional development patterns but based on a well-conceptualized and creative vision managed for timeliness and cost effectiveness. The results are a combination of land uses inter-connecting for sustainability.

**DISCUSSION TOPICS**

1. What is the trend in single-family, detached-housing project layouts?
2. Cite the reasons why a new urbanism project may not be viable for all parts of the country.
3. How important are recreational uses in marketing a large-scale project?
4. Explain why or why not a higher-density housing project is the answer to satisfying the low- and moderate-income housing market.
Chapter 6

"Boomers" and "Golden-Agers"

6.1 Introduction

For decades, every parent has asked the question, "Where will my children live?"
For the next thirty years, our 55 and older population will exceed 43 percent of the
total population of the United States. Our children will ask: "Where will our parents
live?" This market segment, termed Golden-Agers, will span ages from 55 to 85 years
old. This demographic segment—having wealth, education, good health, and active
lifestyles—has not been matched in years past nor will it be duplicated in the future.

For the most part, this demographic group will strive to remain in their current
location, where they will retire or reduce their work time. This decision will be
influenced by family, friends, and a sense of community. Although the Sunbelt states
have experienced considerable sustainable growth from retirees, igniting the ancillary
uses servicing the population, this growth will be dampened by the sheer essence
of growth boundary limitations as well as population growth outpacing community
services. This is and will be happening in aggressive growth-friendly municipalities.
The aging population will outpace most growth areas.

The housing industry will seek alternative locations to provide housing options
sought by a discerning population. Small towns, satellite communities, and large-scale
master-planned communities will meet the needs of the marketplace. A large-scale
project should seriously consider land-use allocations associated with housing options
for boomers and golden-agers. Communities designed specifically for active adults are
being considered by all of the national builders based on the market depth. However,
because the industry is fragmented, production of housing meeting the specialized
needs of the aging populace will not keep pace with the demand; thus, waiting lists
and alternative housing options will result.

Not only does building to specialized housing needs make eminent marketing
sense, based on the sheer numbers, but it also makes sense based on the fact that
most active adults working part-time or retiring would prefer to stay where they currently live. If a large-scale project included different levels of housing options and services to attract a local buyer, the master developer would provide further diversification in housing offered and further accelerate the absorption of the land. Offering a well-planned, large-scale project with a sense of community, a small-town feel, and close proximity to a metropolitan area will attract 55 to 65-year-old buyers. Many of these buyers will opt for an active-adult community environment, including recreational amenities, to establish a social structure and to reduce the size of their home (see Fig. 6.1). They will not, however, sacrifice aesthetics, house finishes, or community lifestyle. Their preferences will require any new community to allow them to develop a sense of belonging. There are significant planning concepts being implemented in market land-development projects for the aging population.

A large-scale project provides the most advantageous opportunity for the designer and master developer to include various levels of housing and services targeting
buyers of retirement ages. Integrating the retirement-age market within a diversified marketing plan—from affordable housing to estate homes—can be best achieved in a large-scale project. The intent of this chapter is to outline current levels of boomer and golden-ager housing alternatives for inclusion in the land-use plan. Most owners of many types of senior housing projects are management or business entities that rely on turnkey contractors for construction activities. A project earmarked for the active-adult market may have several for-sale housing options and will be designed, constructed, and sold by a home building company specializing in meeting the needs of this market segment.

There are several levels of boomer and golden-ager housing options that can be incorporated into a project permitting those homeowners in this market segment to stay and ultimately move into other specifically designed residences within the same project. It is practical and cost effective to market these housing opportunities to those seeking housing diversification and to be a part of a larger, well-planned community. Without considering housing options for specialized care, this chapter will define and analyze the following housing and service levels for the demographic age group from 55 to 85 years of age: active adult communities, transitional communities, independent living or congregate care, assisted living, and continuing care and nursing home facilities.

6.2 Active-Adult Projects

Specialization in design and development of this market segment started in the 1970s. Most communities were planned and designed for the “65 year old and above market,” since most jurisdictions controlled the age limit for those entering an age-restricted retirement community. Since this initial niche market approach, this housing segment has transformed from senior housing to retirement housing to the active-adult community.

In many instances, the age threshold for entering an active-adult community has been lowered to 55 years of age. This is a significant change since the age group between 55 and 65 years of age are still working, and housing projects must market to a specific segment of the home-buying public. The progression of project development for active adults has been also to maintain a high level of activities, amenities, and entrance features (see Fig. 6.2).

The baby boomers have impacted housing-product design by causing square footage of the home to increase and lot sizes to decrease. This trend will continue as baby boomers select active-adult communities as a lifestyle change. Their decision will become easier as developers include active-adult housing areas within large-scale communities, so buyers have the opportunity to stay in the same location in which their roots have been established. In a large-scale community, the location of an active-adult land use can be located almost anywhere in a large-scale project and adjacent to almost any other land use.

Active-adult projects have been and will continue to be a significant option for builder-developers. The design program for this type of project would include
internalizing the project by limiting perimeter exposure and providing internal connectivity for security, sense of community, and exclusivity. If the overall project will include a golf course, the active-adult project is a logical partner in planning the relationship between a golf course and a housing area (see Fig. 6.3). Connectivity to the golf course by golf cart or use of pathways will enhance the value and marketability of the homes.

The active-adult market has discretionary funds to opt for golf course views and the available resources to be an active participating member of the golf club for social and recreational activities. Even with a golf course amenity, the active-adult project would also contain its own community clubhouse. This would be the center of the social structure, which would include recreational amenities, social activities, events planning, specialized programs for hobbies, crafts, and group meetings. The recreational offerings should be programmed for the active adult and may include exercise and weight rooms, billiards, indoor tracks, swimming pools, spas, tennis courts, paddleball courts, bocci courts, croquet field, etc. The market study for the
Figure 6.3  Recreational Components. Golf courses, tennis courts, walking trails, bike paths or bikeways, passive recreation uses are demanded by the preretirement market and the aging populace. Focus-group sessions for the active-adult market identify project elements appreciated by this market segment.

overall project would include an analysis of the activities of interest to the buyers. The location of the recreation center of an active-adult community is typically located in the central part of the project, for ease of access by car or by walking (see Fig. 6.4).

This market segment may include a diversification of product to address the needs of this age group. Multiple-story buildings would include elevators, and single-family, detached homes on small lots will include oversized garages, second-story visitor suites, and partial basements. The connectivity to mixed-use or commercial retail will also be important. If the active-adult community is of significant size, the project itself will promote other uses to fulfill a need of the active-adult buyer. Other uses that are linked to adult communities would include specialty retail, professional offices, and mixed uses. The professional offices may include medical and legal uses. The baby boomer market will demand a change in the way property will be developed. They will cause zoning restrictions and impose covenants and restrictions protecting property values.

The baby boomer generation will demand use of home for occupation (or work) purposes, work from home, or other home-office work as a permitted use within the
community. The active adult will still be working, but working at home will soon be a significant trend in the marketplace. The covenants and restrictions imposed shall provide for home occupations that are typically not considered a permitted use in a residential zone. This zoning provision would allow preretirees to have a home office and conduct business. Those individuals who have retired but have an occupation easily managed from a home should not be restricted from doing so. This flexibility alone would help meet the needs of baby boomers.

The site design must also be ergonomically designed for the active adult and the in-place aging market. Street, pathway, and yard grades should be designed to meet ADA (Americans with Disabilities Act) requirements. The housing design must also accommodate ADA design features. Special attention to the yard grading, by minimizing the steepness of the yards, and access from garages to the front door is important (see Fig. 6.5).

The site characteristics evaluated during the site-analysis and due-diligence period may require significant earthwork operations to cater to the retirement market. The cost allocations for site work, amenities, security, irrigation systems, recreation
components, landscaping, street-scene enhancements, entry features, clubhouses, and other common-area improvements must all be evaluated and financially assessed for the entire community. Many of these elements of the site should be constructed during the first phase of the housing area. This specific buyer demands immediacy and assurances to know promoted ideas and concepts of the lifestyle will become a reality. The master developer must budget for many of the lifestyle aspects of the project to be built in the first phase of construction. The best marketing scenario is to have the recreation complex under construction before the grand opening of the project.

Many government entities favor active-adult communities because of the tax advantages and less stress on public services. To create a well-designed active-adult community, the infrastructure design standards need to be evaluated for practicality and functionality. Design team members having active-adult-community design experience provide the builder-developer with proven concepts and methods to enhance marketability and reduce hard costs. A neotraditional neighborhood design is an excellent design option for an active-adult project. The neotraditional approach, where vehicles are typically parked in a garage, separates the cars from the aesthetic street.
scene and pedestrian movement (see Fig. 6.6). Infrastructure costs can be reduced by restricting parking on the street and designing designated areas for visitor parking. The alleyway for garage access is typically owned and maintained by the homeowners association and should be of quality construction; but it may not have to meet the same standards governing public roadway design due to the reduced use.

6.3 Transitional Communities

As the population ages, there will be various housing opportunities from aging in place, dual primary residences on one lot, shared housing extending to specialized care facilities. Most jurisdictions do not have all of the housing options available to meet the housing needs of this market segment. Nor do they have current zoning ordinances addressing the various housing options. Currently, most, if not all, of the various housing options for aging boomers and golden-agers, if available, would not necessarily be in close proximity to each other. This is simply because the housing industry is localized, fragmented, and specialized. And government does not provide
a mixed-use zoning option for various levels of housing, services, and care located on one parcel of land. For a master-planned community designed for the active adult, the builder-developer should consider a transitional community design.

Most of the independent, assisted, and continuing-care facilities have multiple units contained within an expansive one-story building or multistory buildings situated on small in-fill sites. However, most of the active-adult communities are designed in large-scale projects located near existing communities. The populace in most active-adult communities may consider aging in place in their home. However, the housing product is merchandized to the 55- to 62-year-old active adult. The project design, amenity package, and home design are typically not programmed for adults aging in place. The site and house-design ergonomics for 55 to 62 year old is different than that designed for people 70 to 80 years old. The boomer generation is living longer and remaining more active than any other generation, and aging in place may extend well into their 80s. However, there will be a time for the older adults to consider moving into another level of senior housing. Considerations will primarily focus on house design and maintenance issues or upkeep of the home. Being close to family and medical facilities is equally as important. These factors, if available in a marketplace, will provide a viable living arrangement suitable to age in place until a decision is made to move into a specialized-care facility.

Since the boomer and golden-ager market will dominate the housing market for years to come, master developers should be considering a transitional community design (see Fig. 6.7). This project approach combines several housing options within the same project. The active-adult portion would be one-story, single-family homes on small fee simple lots, minimizing yard maintenance but promoting ownership independence. Since other housing components will be included in the project, the single-family homes could be wired for fire, emergency vehicles, first aid, medical, and police or a private security company. Again, the homes should have a zoning provision permitting an occupation use within a residential use for those seniors continuing to work. The connectivity between the single-family area and commercial areas and pedestrian linkage to the balance of the transitional community would be ideal. By providing various housing options, the master developer, in a sense, is creating a built-in marketing tool, since those seeking alternative housing can stay in the immediate vicinity and within walking distance of their friends and neighbors. The aging group will also have a tendency to move together and to seek housing units near each other. Having different levels of housing in an adult community integrates the market and increases the absorption rate by interconnecting the market segments.

The transitional community approach provides various housing opportunities within the same project boundaries. At 55-years old, an active-adult housing community with all of the activities and amenities will attract empty nesters seeking a lifestyle change. The transitional community would also provide housing stages beyond the single-family, detached living to assisted living, congregate care, and continuing-care facilities. All within the same project boundaries. This is similar in approach to continuing-care communities that provide a continuum of care and services beginning
with assisted living and advancing to specialized care or skilled-nursing services within the same project boundaries.

The essence of a transitional community is to create various market segments within the same project, allowing buyers to change levels of care but stay close to their extended family and live in the same community as active adults. The disruption of moving is minimized and starting over is eliminated in a transitional community.

6.4 Assisted-Living Facilities

An assisted-living facility provides a combination of housing options while providing support and care services (see Fig. 6.8). An assisted-living facility is a large expansive building or a combination of several buildings within a confined area. The site design requires a high intensity use of the site. Parking facilities are typically designed for residents to have vehicles; but the parking space ratio to the unit is between 0.5 to
Figure 6.8  Assisted-Living Facility. Nonmedical assistance is available to residents who are unable to function on their own.

1.0 space per unit. The parking space dimensions may however be wider than the standard parking space. A 22-foot wide space would better serve the users. There will also be more handicapped spaces, exceeding ADA requirements. Activities and amenities are important components of an assisted-living facility design. This type of facility can be located adjacent to active-adult housing and close to mixed-use area or retail uses. Many projects of this type are located near major access points or central activity areas. Residents of an assisted-living facility are less able to function on their own and may require nonmedical assistance for certain daily activities. Services included in an assisted-living facility may include: meals, nonmedical assistance, medical services availability, social programs, recreation facilities, housekeeping, and van service.

6.5 Congregate Care Facilities

Congregate-care facilities serve residents requiring a higher level of assistance than assisted-living residents (see Fig. 6.9). The housing arrangements are generally
apartment-style design, either leased or owned as a condominium unit. The buildings have separate living areas and common spaces for living and sharing in social and recreational activities. Many of the same services offered in an assisted-living complex are offered in a congregate-care facility. The building design provides a sense of independence for residents. These living areas are compact in design and grouped in large buildings with a central core area for care services.

6.6 Continuing Care Facilities

A continuing care residential community (or CCRC) is a project type that contains various levels of care service and personal assistance. In many states the financial aspects, such as a long-term contract, and the levels of service and assistance define the type of facility. Typically, a CCRC is designed as a campus including:

Figure 6.9 Congregate Care Facilities. This type of facility is another step in increased caregiving to the residents. Separate living areas and common spaces for social and recreation interaction dominate the building design program.
living, assisted living, and a skilled-nursing facility. The success of the CCRC depends on the level of their care services. Since the residents enter a continuing-care facility complex assuming they will be at this facility for the remainder of their lifetime, CCRCs provide a continuum of care.

6.7 Nursing Homes, Critical Care, and Specialized Care Facilities

There are three types of facilities beyond the continuing-care level of care service. These facilities are constructed separately from other adult-care facilities and can be situated on in-fill sites. Typically, a large-scale community plan would not include these uses since the proximity to a local hospital is important. The owner is a specialized entity experienced in the operation and management of these types of facilities and understands the needs of the residents. These facilities generally require state and local licensing and inspections. Residents requiring 24-hour-nursing services and in need of short-term, intermediate, or long-term skilled-nursing care will consider nursing homes and critical-care or specialized-care facilities as their primary housing options. Specialized-care facilities would include Alzheimer-care facilities. This facility is designed distinctively for Alzheimer patients requiring proper supervision in a controlled and safe living environment.

6.8 Boomers and Golden-Agers

The boomer and golden-ager generations will continue to demand the attention of the housing industry. The National Association of Home Builders created a 50+ Housing Council to provide guidance, education, and industry support to the membership involved in senior housing. As the aging population grows, the housing industry must address the issue of specialized needs of the retiring boomers. Senior-housing options must be localized and designed well for a better-educated, healthier, and wealthier active-adult home buyer. Large-scale communities provide an excellent opportunity for developers to include various uses fashioned for the aging market.

The concept of locating senior housing adjacent to first-time and move-up residential projects will provide the very connectivity to an environment based on youth, energy, and enthusiasm, which aging buyers seek. This subliminal land-use relationship is consistent with market trends and attitudes of boomers. Boomers may never retire, but they may slow down. Boomers will seek second- or third-career jobs, part-time work, mentoring opportunities, or volunteer work. Large-scale master planned communities are best suited to generate a land-use plan reaching all boomer and golden-ager market segments. The logical land-use relationships in a large-scale project may begin to change as boomers and golden-agers increase their market share. Their voice of choice will resonate throughout the building industry and effectively change the view local government has on meeting the needs of this age group.
6.9 Resources on the Internet

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6.10 Summary

The demographics and economic wealth are well documented for the aging populace. Master developers should consider the various levels of housing opportunities for this age group regardless of market location. Meeting the needs of this market segment is not new, but it can be improved upon. Significant strides in transitional community design permits those 55 years of age and older to retire and live with their friends and in an area in which they can move from one housing type to another, without leaving the community. Retaining a sense of community and lifestyle with those of the same age but within a large-scale community of all ages will attract baby boomers and golden-agers. This, in itself, is a sustainable community.

DISCUSSION TOPICS

1. List four specific site considerations that will attract the active-adult market.
2. What are the benefits of building a transitional community project?
3. List recreation elements specifically designed for the active-adult market.
4. What infrastructure design changes can be realized for implementation in an active-adult community?
Chapter 7

Preparing a Land-Use Plan

7.1 Introduction

Preparing a land-use plan can be achieved by anyone in the land-development business. Because land forms, parcel configurations, government regulations, and market conditions vary from jurisdiction to jurisdiction, every large-scale land-use plan is specific to a site. The variations of the land plan can be endless, since there are no correct answers but optimum solutions. Land-use planning is not an equation for which variables and factors can be categorized and answers found in a book.

Land-use planning concepts and vision weigh each approach against cost and marketability. Land-use planning for a large-scale project is an art not a science. Preparing the optimum solution for the property based on its location and market demands is a challenge. The talent needed to meet this challenge is derived from experience combined with the basic knowledge of land-use relationships. This experience is translated into land-use-plan alternatives compared and analyzed by the developer and the design team. The ultimate land-use plan is a consensus plan. Providing land-use flexibility in the plan is essential to adapting or changing the plan to meet market and industry changes during the build-out period. There is however a basic approach that can be taken in preparing a land-use plan.

The boundary and topographic survey of the property will be the basis on which the site-analysis information will be compiled and illustrated. The parcel configuration, adjacent existing land uses, and proposed land uses surrounding the proposed site will provide guidance in preparing the land-use study. The survey would also illustrate the location of existing road connections, frontage roads, vegetation, streams, wetlands, rights-of-way, easements, and title problems with the property lines. Each of these existing conditions will influence the initial planning approach for the project. The design team selected by the master developer will prepare several land-plan alternatives for consideration.

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Several key elements of the land plan would include selecting the main entrance location to the community via an existing frontage road. This access point must be selected to provide the most advantageous marketing window for the project. This road connection should be selected for visibility, volume of traffic, and ease of access to a major highway system or another transportation link. Having existing road connections for multiple accesses to the community would provide design flexibility. The base survey would illustrate those roads to be considered for secondary or emergency access points from the proposed community. The selection of the main community entrance will influence the pattern of the land-use plan.

From base-survey information, the existing water and sewer line locations will be shown on the base map. The location of these facilities should influence the selection of the first area designated for development. A goal of the design team is to phase in infrastructure improvements to release land-use pods as needed to be in compliance with the budgeted absorption rate for the project. The intent is to minimize the up-front expenditures but maximize the number of different land-use pods available for sale.

Selecting the main entrance location and entry design will establish the sense of arrival and image for the entire project. Once the main entrance location has been determined, the focal point of the community must be emphasized in the land-use plan. The focal point of the community could be visual, particular site characteristics, or a proposed amenity package. Using the site-analysis illustrations, the design team will prepare a land-use approach, using the entrance location, community theme, and site attributes to emphasize the project focal point to achieve a marketing edge. The sense of arrival and focal point of a community creates the “sizzle” for marketing purposes as well as a memory point for buyers. Achieving the balance in establishing the community image with the initial cost of development is an art achieved through thoughtful purpose and creativity. Separating the community design intent from the competition will create an identity recognizable for many years.

The site-analysis illustrations will be used to isolate areas for development from areas retained for passive, recreational uses or open space. The arrangement of land uses becomes an assessment of the existing surrounding uses integrated with the results of the market study and market focus group information.

### 7.2 Market Demands

The existing surrounding communities and the market study provide the basis for which land uses are distributed throughout the project. The distribution of uses will control the pace of development and correspond with the expenditures necessary to construct infrastructure serving each land-use area. Within each land-use area, the master developer should establish the product price points for further market segmentation. The market study would highlight the residential land use with the greatest market depth and demand. This selected residential land use should be the
initial sales and construction phase of the project. If marketed properly and established price points are consistent with the market study, the initial housing area will sell and seed the project with the least difficulties. The construction of the initial residential project energizes the marketplace. The vision and promotion is suddenly realized with the first rooftops being constructed. The first housing area should be sold to a local housing company with an impeccable reputation for building quality projects. The investment of the entire community will springboard from the initial housing project. The initial housing-area location will be selected based on the main entrance location, adjacent land uses, specific site characteristics, and location of the community focal point. The location should also be visible from the marketing window or from the main community entrance road.

7.3 Market Segmentation

Large-scale projects require a significant financial evaluation of the common infrastructure-improvement costs versus the pace in which land-use parcels are conveyed to other builder-developers. The market study highlights various land uses in which a demand exists. The design team members evaluate the market study and use it as a guide when distributing land uses. As an analogy, a builder of a fifty single-family-lot subdivision may have three models with three different front elevations for each. This will create three different price points for each model. This expands the market by providing viable housing options within the same project. This is similarly accomplished in a large-scale project by the segmentation of land uses by density, product, and price. The builder-developer may be different entities for the various land uses. Thus segmentation by land use expands the marketability of the project and thus potentially increases the absorption of the land. In addition to the appropriate covenants and restrictions, the master developer would establish a timetable in which sales and construction must commence. The timing is associated with phased infrastructure construction being completed to service each area released for sale. The absorption of the land or land-use pods can be managed by price, location, use, and timing. The absorption factor allocated for project budgeting should be conservative and realistic for cash flow projections. The design team will use the market report, existing conditions, site-analysis illustrations and summaries, project vision, developer goals, and budgets to prepare land-use planning alternatives.

7.4 Opportunities and Constraints

Existing land and site characteristics will define those areas to be exploited or areas to be assigned specific land uses. Exploited in this sense does not necessarily suggest mass clearing and grading but, rather, taking advantage of what the land and characteristics of the land naturally provide. Opportunities to accentuate for marketing and land-planning purposes could include: land form, views, natural vegetation or forestation, adjacent existing land uses, streams, lakes, historical features, etc. This
approach creates a marketing and design hook for the entire project. Land form used properly through distribution of land uses and product selection will guide clearing and earthwork design. Design professionals should use the land form and attributes as the basis for land-use planning. Ignoring the natural features of a site will cost the developer financially and negatively affect the image of the project. The concept of mass clearing, grading, and strip-building pads should not be the norm. The marketplace expects a project to fit with the existing land form. Taking advantage of the existing site conditions will be a positive marketing tool and image builder.

Physical constraints of the site must also be considered. Constraints are areas to remain untouched or areas uniquely designed to minimize costs. These constraints should be identified during the site-analysis work and be illustrated on an opportunity and constraints plan. Constraints may impact direct construction costs, affect the net buildable area, or alter the overall land-use plan to overcome the constraint. Costs or limitations should be assessed for each constraint and calculate the ramifications to the project’s financial viability. Regulatory constraints may also have a significant impact on the design approach for the project.

As an example, should a floodplain be considered an opportunity or a constraint? It is both. A floodplain certainly reduces the net buildable area, but it provides a natural feature to be exploited in the land-use plan for views, open space, and possible passive-recreational uses.

As an example, high groundwater or expansive soils typically increase the cost of development and should be considered constraints. High groundwater may cause dewatering operations for utility-line installations, thereby increasing the cost of development. High groundwater may also preclude a builder from offering basements in the housing-product offerings. This may be a marketing detriment. However, high groundwater may allow the use of wet ponds throughout the project, which may be considered a perceived value as they add water views to the project design. Expansive soils, rock, or other unsuitable soil conditions will impact the cost of development and alter the way the project is developed. Adverse soil conditions may impact foundation designs, construction quality, and earthwork moving costs. Constraints identified in the due-diligence period present a decision matrix for the developer:

- Are the constraints too cost prohibitive to overcome or resolve?
- Do the constraints alter the land plan to be inconsistent with the overall project goals?
- Will the schedule be delayed in design, permitting, or construction due to the constraints?
- Can the constraints be minimized through land planning and engineering expertise?
- Can the constraints be considered opportunities?
- How will the constraints affect the land-use plan and ultimate project design?
A go-or-no-go decision based on the constraints is needed at the due-diligence period but also reconsidered as the land-use planning alternatives are debated by the design team.

7.5 Land-Use Relationships

Are there dos and don’ts in locating and distributing land uses within a project? Are there dos and don’ts on selecting adjacent land uses? Are there dos and don’ts concerning uses adjacent to the town center, recreation complex, or industrial area? There are no rules. However, in designing a large-scale project, the developer must constantly consider the needs of the property end user. Ultimately, the homeowner, business owner, visitor, shop owner, and others should influence the decisions of the master developer. Distributing and locating land uses within the project boundaries is a puzzle guided by the market and project goals. An initial design approach is to integrate land uses with the existing land form, surrounding uses, and design program for the project. Then modify the plan for marketing, infrastructure, financial, and scheduling reasons. Traditional land-use planning would locate high-density residential housing closer to commercial and retail. The land uses of larger residential lots would be separated from high-density-housing, commercial, or industrial uses. Town center or retail mixed-use areas are centrally located for ease of access from the residential components and to major transportation links. However, there are no rules. The parcel configuration, land form, and site constraints will influence the land-use selection for each specific area within the project (see Fig. 7.1).

Profitability of a large-scale project is contingent, in part, on managing the infrastructure phasing and diversifying land uses by phases. The project amenity or recreational component, such as a golf course, will be highlighted on the plan. Designers would locate the community focal point, such as the town center, on the land-use plan. Open space areas, nonbuildable areas, and site-constraint areas would be identified and parceled off from the areas to be developed. The balance of the property would be available for a variety of land uses in which land-planning concepts, covenants and restrictions, and construction timing would guide the design team to the optimal approach. The balance of the property should be assessed for marketability and absorption. Thus diversification of uses within each use group would be advantageous in maintaining design flexibility. Changing land uses to answer fluidity in the market will assist the master developer in managing the pace of development and meeting current market demands. There are transitions between land uses, especially higher to lower intense uses. Transitions can be accomplished by stepping land-use intensities or buffer uses with open spaces, site amenities, or natural site features. The relationship of uses is not a result of a fixed pattern of design but consideration of the end user and the connectivity of the uses. As an example, would you plan a 10 to 12 unit per acre apartment complex next to a quarter-acre-estate lot project? Land-use relationships are managed through appropriate design solutions and concepts. Since large-scale projects have multiple solutions, the master developer must assess the marketability of each land use pod as it relates to the surrounding
Figure 7.1 Land-Use Relationships. Creative uses of land and their interrelationship with other uses will continue to evolve. Without a certain pattern for success, meeting market demands is essential for a profitable community plan.

uses. Rearranging land uses into a phased marketing approach may be necessary for the project momentum and cash flow considerations.

7.6 Core Infrastructure Planning

Cash-flow analysis is based on the absorption rate in which land-use parcels are conveyed and the infrastructure costs associated to serve those parcels. Phasing of the core infrastructure serving the entire community is an important design consideration. The timing of expenditures will be established early in the process. The design of the core infrastructure is important for the master developer, so the developer is able to stop or slow down work by phases, as needed, to manage expenditures and control absorption. The engineering design of the core improvements must reflect a thoughtful phasing plan. Access-road alignments, looped water mains, properly extended sewer systems, and drainage systems handling defined drainage areas are all elements of a phased construction plan. The design team should use a phasing plan in developing the diversification of land uses within the project boundaries.

Phasing an overall community amenity package may be a benefit to properly managing cash flow, but marketing the project may cause this element to be accelerated.
However, careful land-use planning, phasing, and engineering design will not alleviate the fact that large-scale projects require significant cash-flow commitments for soft costs and up-front construction costs. Phasing of the core infrastructure will allow the master developer to better manage cash flow as the project flourishes. The performance-bond requirements imposed by government may also be posted according to the phasing of construction. This would permit the developer to reduce bond amounts and seek maintenance bond status as the project moves forward in phased construction.

### 7.7 Street-Scene Marketability

Attention to details will help establish a project identity and differentiate the project from the competition. The master developer should establish covenant and restrictions within each land-use area to maintain aesthetic control over the development practices and architectural look of each area. Streetscape or street-scene concepts will require up-front cash-flow commitments, but the results should establish a sense of community with memorable features and market-driven components (see Fig. 7.2).

![Figure 7.2 Streetscapes. Site-planning techniques and streetscape design will set a project apart from the competition. The attention to detail beyond the structure will have a positive affect on first impressions.](image)
Each element of design would be factored into the phasing program and cash-flow analysis. Each streetscape design element would be evaluated for materials, color, and style. The street-scene elements would establish the image for the development. Each individual land-use area would complement the overall community image to ensure design consistency throughout the community. Common street-scene components include the following:

- street trees lining the roads
- special intersection design features, including alternative pavement surfaces
- project and community-entrance features
- street lights
- street signs
- signage
- privacy walls
- perimeter buffer areas: landscaped and irrigated
- open area vistas or views
- water elements
- common-area amenities, including clubhouses strategically located
- pedestrian pathway systems and bike lanes

Based on the theme and marketing approach for the large-scale community, the street-scene elements would be consistent with the vision and enhance the visual presentation of the project. Many of the design elements are cost effective and provide a significant visual impact.

### 7.8 Design Team Member Overview

Large-scale projects require vision and creative concepts that cater to discerning buyers. A master developer should retain the services of experienced design professionals to develop a design program that is marketable, practical, and cost effective. Innovation may not necessarily be a valid approach for a project requiring multiple years for a complete build-out. The master developer needs to balance design approaches against government oversight, marketability, and costs to bring a large-scale project to market in a timely manner.

Regardless of the project complexities, a design team should be organized by the master developer early on in the land-purchase process. The land-development industry has always been based on the developer’s business relationships and experiences. A master developer should always adhere to the goals of having a project developed on time and within budget. Creativity comes with a price, and delays will always cost. The importance of the motivation and creative interaction between the developer and the design team members should take precedence over fee. Design team members
having a business relationship with the developer should not override the need for creativity and experience in designing large-scale projects.

All design team members need to be encouraged to participate in discussions of ideas; offer their comments; engage in the debates; present solution to issues raised. Uninhibited thought and creativity should not be stifled by developers who want to build monuments for themselves. Successful developers focus on budget and time. They encourage the professionals to think beyond the conventions, so they can decide on proper courses of action for their company and for the project. The following list of design team professionals and their perspective roles should be considered for every large-scale project.

**7.9 Marketing Research Firm**

The market research firm selected should be cognizant of the marketplace in which the project site is located. But more importantly, the firm must have experience in large-scale master-planned communities and the various market segments. Finding the firm best suited for the project may require an interview process and review of previous market studies prepared by the firm. Interviewing the principal and person(s) assigned to the project is an important part of the selection process. A commitment to a timetable for completion is more important than the fee. The market research information is critical to the overall project-design approach. The market research firm will assess and evaluate issues including:

- site location
- assessment of community services
- amenities; size, components, style
- specific housing types, size, and style
- standard features, unusual features, and options
- housing mix
- land-use options
- price points
- community pipeline of planned, designed, or under construction projects
- phasing of land uses
- buyer profiles and mix, depending on land uses
- absorption rate
- growth trends
- nonresidential uses
- employment characteristics
- household size and characteristics
- association fees
- maintenance packages
HINT:

Contact the local home builders association or the National Association of Home Builders for a list of members with market research expertise. Also, contact other large-scale project developers for recommendations.

7.10 Surveying Firm

The preparation of the base map for land-use planning and project-design programming is essential during the due-diligence phase. Some developers strive to use tax-map information or other available data; but this information may not be accurate, and using this information for land-use planning may prove unreliable and lead a project astray. The property-boundary survey based on the title report, recorded deeds and recorded final maps, and/or other certified boundary surveys will provide sufficient information to assess the net buildable area within the tract boundaries. The property lines will be field run to ensure proper closure. The survey will highlight encroachments, property overlaps, gores, easements, and dedicated rights-of-way. Other areas—e.g., wetlands, buffers, floodplains—can be surveyed or depicted by metes and bounds to identify areas not suitable for construction.

As an example, high-tension power lines are typically located within a substantial utility right-of-way. The width and alignment of this right-of-way will affect the land-use plan. The location of high-tension power-line stanchions will also affect the land-use plan and infrastructure layout. In some instances, the stanchions may be offset within the right-of-way, because the utility company is planning for future expansion.

During the initial land-use planning of a large-scale project, a developer may opt for publicly available topographical surveys rather than incur the expense of field-run or aerial topography. This course of action is exercised during the due-diligence period for an initial project assessment. Once the developer decides the project is viable, an accurate topographical survey would need to be prepared by a surveyor. The existing topography of the land will further impact the pattern of development and distribution of land uses. The boundary and topographical surveys, combined with other identified encumbrances, will further refine and define the buildable areas suitable for land-development activities. The topography may be prepared using aerial photography or by a field-run survey (see Fig. 7.3).

The surveying firm should also provide services for existing frontage road and/or connecting road field-run surveys. Cross sections, at every 50 feet, should be taken of the existing frontage road. The centerline profile should be established to ensure sight-distance requirements are met at the proposed access points into the project. The existing survey would also show telephone poles, drainage structures, pipes, curb lines, driveways, signage, etc. The firm would also provide survey information on sewer- and water-line locations, which would be used for connections. The as-built
Figure 7.3 Surveying Design-Team Member. Technological capabilities, experience, and manpower provided by multidiscipline, professional consulting firms are best suited to service developers of large-scale projects.

Sewer elevations and location survey is essential to knowing how the project can be connected to the existing lines. It is advisable for the developer to use the same surveyor for the boundary and topographic surveys. The construction layout of the infrastructure does not have to be done by the same surveying company. However, a close working relationship with a civil engineering firm that has surveying capabilities would allow the developer to manage one company rather than two separate entities. The developer should consider a system of checks and balances to ensure the topography is accurately shown on the base map. In a large-scale project, a topographical “bust” in elevations could result in a cost problem that might be discovered only during construction.

Seek a firm known for its quality surveys and its thoroughness. An accurate base map is an absolute must, and a firm not equipped to handle a large-scale development should not be considered for the design team. The surveying firm should have substantial land-development experience, be equipped with the latest technology, and provide the results of their efforts electronically. They must meet established deadlines.
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to finalize the base map. The land-planning process must begin on schedule, and an accurate property boundary and topographical survey minimizes any guesswork by the design team.

HINT:

Contact the local approving agencies and review submitted plans. Review the survey information for presentation and style. Require references and evaluate their experience in the land-development business.

7.11 Environmental Consultant

The environmental consultant is a key member of the design team for site-analysis assessment to determine development potential. Government regulations have evolved into protecting natural resources, such as wetlands, resulting in less land suitable for development practices. Many environmental regulations provide permitting and design options addressing environmental constraints, but such measures may add time to the approval process.

The master developer needs to retain an environmental consultant during the due-diligence period and prior to the initial surveying and existing-condition assessment of the property. The environmental consultant would be charged with in-field delineation of wetland areas for surveyors to locate by metes and bounds for the base map. The environmental assessment of the property would include investigations for endangered species or plants. Buffers are typically imposed around the endangered species or plants. The protected species or plants may also be located on adjacent property and the buffer dimension may impact the subject site. Environmental consultants may also undertake site inspections in accordance with the requirements of an Environmental Phase I assessment. The selected consultant could also be experienced in identifying specimen trees. These large trees would enhance the project and also comply with tree-save ordinances. In essence, the environmental consultant is removing land from development consideration or providing alternative solutions to help developer be in compliance with environmental regulations.

Since many environmental regulations are imposed at the state or federal level, the consultant should have an excellent working relationship with the approving agencies and a close working relationship with the case managers. The consultant needs to be current on all environmental regulations imposed at the local, state, or federal level. As an important design team member, the expertise of the consultant is based on technical knowledge but also the ability to translate the regulatory process into developer terms. Environmental issues are easy for the general public to understand. In many jurisdictions, the general public will use environmental concerns as a reason for disapproving, delaying, or altering a development project.
Typically, the environmental consultant would prepare an environmental impact statement as an ancillary document submitted with the overall land-use plan for the project.

The educational background of an environmental consultant may have educational emphasis in one area and work experience or training in other areas. During the site investigation, the developer should determine the key environmental issues and seek a consultant with the educational or training background specific to that area of concern. As an example, the property may have numerous wetland areas impacting the development pattern of the project. The exact wetland delineation is essential for completing the base map. Thus, the environmental consultant should have expertise in wetland delineation. Environmental consultants may have degrees in: biology, rangeland ecology, geology, hydrology, forestry, geography, wildlife biology, environmental engineering, hydrogeology, soil science, water resources, or civil engineering. A developer should seek a consultant with expertise in the subject matter but one who understands the development business. Developers ask for practical views that translate into a balance between cost-effectiveness and profitable projects based on environmentally sensitive designs. Environmental consultants can be a part of a multidiscipline engineering firm, a separate company, or a sole proprietor.

HINT:
Many engineering firms partner with environmental consultants. Seek recommendations from design engineers, and contact government agencies to obtain a list of environmental consultants. From a short list, schedule interviews and obtain a commitment to a schedule.

7.12 Soils Consulting Firm

At the due-diligence stage, the soils firm will map the on-site soils and transpose this information to the base map. The soil classifications will be identified and an assessment made on the impact the existing conditions will have on general site-development activities and building systems. The mapped soil types would identify problematic soil conditions that would then be field verified by a specific exploration program in those specific areas. This information is of value in determining the layout of the land-use plan and the selection of the specific land use for a specific area within the property. Once the land-use plan takes form and the infrastructure nucleus has been established, the soils-testing firm would revisit the site and field test systematically along the centerline of the main road and along the proposed sewer-connection alignment (see Fig. 7.4). The recreation complex should also be field tested for soil and groundwater conditions. This information would be provided to the architect for foundation designs.
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Figure 7.4 Soils Testing. Difficult sites and large-scale project areas present new challenges that can be addressed only by geotechnical engineering expertise. Quality construction is a product of a defined materials-testing program.

The developer may consider a limited soil-investigative program for each land-use pod. This field information is important in assessing the value of each pod by the developer. It is important to the buyer in determining the affect the soil will have on the land plan and land-development costs. Inconsistencies in the soil type within the project boundaries or an indication of rock, expansive soils, or high groundwater will justify a more extensive soil-investigation program. The soils firm will also provide input on road-pavement sections, location of storm-water management facilities and foundation designs.

There are no rules of thumb, standard practices, or regulations indicating how many tests or where soil tests should be taken, since every site is unique. The developer should seek input from the engineering firm to establish the soil investigation program needed for design purposes. The intent of soils investigation is to discover areas where land-development activities should be limited. It may outline an option to remove and replace unsuitable material. The investigation will assess the financial impact existing soils have on developing the property and building structures on the site. The
soil-investigative reports would be provided to the civil engineer, structural engineer, and architect. Soil testing may be required during the construction of the primary infrastructure for quality control. The builder-developer of individual land-use pods will have their own design team to assist them during design and construction. The soil-testing firm should be evaluated for their expertise, knowledge of local site conditions, and equipment availability. For soil testing, the experience level, professionalism, and quality of the work product are important factors in the selection process. Generally a soil-testing firm is a separate entity from a land-development engineering company. In some instances, the soil-investigation and materials-testing groups may be part of a multidiscipline engineering firm. It may be beneficial to have a separate firm provide the soil testing, if the soil characteristics are problematic. Developers should seek input from public regulatory agencies to determine the level of testing required.

HINT:

Building departments, soil conservation districts, and public works departments will have knowledge of the soil-testing firms in the area. A short list of qualified firms should be interviewed for professionalism, experience, and quality of their work product. Again, the project schedule must be met by the selected firm.

7.13 Attorney

Several attorneys with different expertise may be included on the design team. The attorney used for the property purchase and transaction may not be the same attorney used to obtain project entitlements. Obtaining entitlements for a large-scale land-use plan in a timely manner should be managed by a politically connected land-use attorney. Local knowledge and personal familiarity with the local council or board officials are important indicators of a successful land-use attorney. Many municipalities have outside legal counsel representing the zoning or planning boards. Since these attorneys are in private practice and have land-use expertise, developers may consider adjacent municipal attorneys to manage their project, but only if there are no conflicts of interest.

During the land-use planning phase and discussions with local government officials, a conciliatory approach is always best, since most large-scale projects require land-use amendments and agreements from politicians, the general public, and agency staff. An attorney having political sense, combined with development business strategies and costs, will be an integral team leader for the developer. The attorney must negotiate and influence the special interest groups and government entities to obtain all of the necessary local permits and approvals.
HINT:

The legal team member should be a consensus builder, have land use expertise, and be well respected within the local community. In most municipalities, the “politically correct” attorney is the right place to start the search.

7.14 Land Planner

The creativity dynamics of design must be coordinated by the professional having the most influence over the final product. This is the land planner. Since the final product is a land-use plan, a land planner should be the lead professional guiding design team actions. For a large-scale project, a developer should consider land planners from outside the marketplaces. For many years, design influence was generated from California, Texas, and Florida, which eventually influenced the development patterns in other markets. This has changed significantly since land planners of large-scale projects operate nationally. Developers must stay current with design trends and products that should support the findings of the market study. Most developers understand the benefits of creative design. Also, discerning buyers are more sophisticated in design choices and also have discretionary financial resources to demand the “nice but not necessary” design elements. This is true in most markets and not associated with a few design conscious states. Master developers should investigate and visit other large-scale projects for land-use ideas and design concepts. This will assist the developer in establishing a vision for the project.

Land planners of large-scale projects must have experience in land planning but also in the business of developing property. Their knowledge of local infrastructure ordinances governing the engineering design of the project is a must. All too often planners present ideas that do not meet engineering regulatory standards. Or the ideas put forward are cost prohibitive. Large-scale-project land planners listen to their clients and understand the community hot buttons that may affect land-use plans (see Fig. 7.5). The engineering discipline needs to review the land-use plan so the approach taken balances creativity with practicality, constructability, and marketability.

The base map with site constraints and opportunities provides the illustrative basis on which the planner starts the planning work. The developer’s vision, and input from other professionals, will further define the land-use relationships for the project. Planners will analyze the site features, surrounding uses, and marketing window to initiate the first land-use plan concept. The final land-use plan is a result of generating ideas from an idea. Land planners will prepare alternative land-use studies incorporating basic information, such as:

- Locations for various land uses; each land-use parcel should be configured for ease of development and maximum utilization of the land.
- Areas (calculated in acres) allocated for each land use indicate the number of residential units or building size for retail, office, etc.
Land planners and landscape architects design large-scale projects. They understand the market, local ordinances, and political hot button issues to prepare a unique land-use plan shaped by the land form and site characteristics.

- Central focal point of the community, i.e., a mixed-use village center.
- Illustrating common areas, community-amenity areas, and buffers.
- Horizontal alignments for the primary roads serving the various land uses.
- Road connections to adjacent properties and frontage roads.
- Utility-line connection locations.
- Locations for major entry features and community-identity elements.
- Pedestrian-pathway systems or other recreational amenities, e.g., a golf course.
- Phase lines for design, construction, and approvals.

The land-use planning exercise requires understanding the market study and the developer’s use and vision of the property, combined with experience. The planning firm selected should have substantial experience in planning large-scale projects and have a creative mind-set. However, when costs and practicalities are factored into the decision, the planner should elevate the goals of the project ahead of self-interests. Developers should define the expectations for the final product and project schedule.
They should arrange weekly meetings for brainstorming and creative debates. The design team should meet periodically to strategize and resolve project issues. A site visit and walk with the design team should be scheduled once the land planner and engineer have reviewed the base map and market study. Developers should ask for and review the planners’ portfolio. Developers should schedule a site inspection with each land-planning firm under consideration. The developer will get a sense of each firm’s approach to the site and determine if the planner also has the expertise to interface with the public, public officials, and government staff members. A planner’s ability to stay on schedule is more important than the creative approach. The developer must provide sufficient time to create the optimum land-use plan but cannot afford to permit planning iterations upon iterations.

**HINT:**

Developers of large-scale projects should consider nationally recognized planners for the land-use studies. To obtain a list of planners with large-scale development-planning experience, contact the National Association of Home Builders and the Urban Land Institute for a list of planners. Specific design elements can be addressed by local planners and/or landscape architects. Ask for their portfolios and developer references. Do not substitute the review of a hard-copy portfolio with a Web-based portfolio.

### 7.15 Civil Engineering Firm

The engineering discipline is the thread through the entire development process. For a large-scale project, an engineering firm must have the ability and capability to be involved through the entire build-out of the project. In many jurisdictions, the land-use plan is a pattern of development, but the engineering plans transform an idea into reality. The civil engineer evaluates the overall land-use plan and other supporting illustrations and documents to prepare construction documents for the project. Construction documents dictate how the primary infrastructure elements are constructed. Typically a set of engineering construction plans will include the following:

- Calculated parcel configurations for all land-use areas (the engineer will work with the land planner on the layout and define the area of each land-use parcel).
- Preparation of cost-effective designs.
- Primary road horizontal and vertical alignments (if the land planner has prepared the land-use plan in accordance with local land-development standards, the engineer will not have to significantly alter the overall plan).
- Phasing plans for the entire project so that each individual phase can stand alone.
- Any off-site improvements serving the project, such as water- and sewer-line extensions, frontage or service road improvements, or intersection improvements. Reports such as the traffic-impact study or environmental-impact study may require off-site improvements.
- Grading and earthwork balancing of the site (the soils-investigative report and analysis will be used by the engineer in balancing the site).
- Soil erosion and sedimentation-control plans.
- Tree-save areas, buffers, and conservation areas will be included on the plans to ensure the construction documents are in compliance with all local, state, regional, and federal requirements.
- Storm-water management facility design for controlling the quantity of runoff leaving the site. (Storm-water management facilities may include centralized detention or retention basins serving the primary road network and individual land-use pods.)
- Best management–practice facility design for providing water-quality controls of the runoff before it leaves the site.
- Storm-drainage design includes inlet locations, pipe alignments, pipe material selection, and sizing of the storm drains. (Design considerations should be given to individual land-use pods and the drainage interconnection of those areas with the primary drainage system.)
- Water distribution plans and details for the connection to the existing water main and the on-site primary water–distribution system. The system must have sufficient fire flows. The plans would include fire hydrant locations and a layout with a looped system, as necessary, to minimize water-service disruptions to the land-use parcels. Sufficient water availability will be determined at the due-diligence phase and any improvements to the existing system are to be outlined by the engineer.
- Sewer-line-extension design connection to the existing sewer line. The construction plans would show the sewer-line layout and profile. The sewage-treatment plant must have sufficient capacity to treat the flows generated from the project at build-out. The plant and main trunk line serving the project should be analyzed during the due-diligence stage by the engineer.
- Amenity and recreation-site plans for common-area facilities. Grading of the golf course and the storm-drainage facilities serving the golf course; improvements may also be required.
- Entry-feature layouts, signage locations, traffic-control measures, lighting plans, street-trees plans, and common-area landscaping designs will be included in the construction documents submitted to local government for review and approval.
- Construction details illustrating sufficient information to depict how elements of the land-development design can be constructed. Most details are imposed by government agencies; but, in many cases, these details are modified by the engineer to reflect specific design circumstances.

- Innovation and creativity in land-development engineering is a partnership with government-based reviewing engineers. New concepts in some jurisdictions may be rejected, while these same design approaches have already been incorporated in other municipal land-development ordinances. Any new design concept may require a change in the land ordinance and necessitate significant time to obtain. Thus, it is important to prepare a land-development-design approach specifically for the large-scale project. Obtain an approval of new standards at the time the land-use plan has been submitted for review. New approaches designed in conjunction with a large-scale master plan may be viewed differently since the standards are only associated with the one project and will not affect the entire jurisdiction.

Construction documents are reviewed by government for compliance with local ordinances. Because of the impact large-scale projects have on public services and affect the land form characteristics. A master developer will need to obtain other approvals for water, sewer, and drainage improvements from regional, state, or federal agencies. The civil engineer is the developer’s representative for obtaining many of these permits. Most approvals and permits are technical in scope but reviewed for political considerations. The developer should be actively involved in the technical discussions, since numerous decisions must be made. If the developer has current knowledge of costs and has an engineering team member who has knowledge of local standards, criteria, community hot-button issues, and who knows the government reviewers, the developer can make calculated decisions in a timely manner. Developers need to stay on time and within budget.

A civil engineering firm may have surveying, geotechnical engineering, planning, materials-testing, and construction-inspection capabilities (see Fig. 7.6). A one-stop shop is beneficial to a master developer, since the management and administration of the design team is centralized with a primary lead consultant. The engineering firm would assign a senior-level engineer to manage the project. The civil engineer is involved in a large-scale project from the inception of the project to the final build-out.

HINT:

A local civil engineering firm should be used for design, construction documents, and permitting. The firm should have the capabilities to meet the project deadlines and have an excellent reputation with local officials. Preparing quality plans are essential to successfully obtaining approvals and permits in a timely manner. A multidisciplinary firm would be a benefit to the developer.
7.16 Financial Partner

A large-scale project requires substantial up-front cash flow for retaining members of the design team, holding the land, and processing plans for governmental approvals and permits. Once the land-use plan has been approved, marketing of the project, and construction document preparation will be initiated. This is all before any construction commences. The development industry is a risk. The purpose of hiring professionals to assist a developer in the purchase, design, and entitlement is to reduce the risk. The cash-flow requirements of a large-scale project are substantial and the commitment to a vision should not be compromised. Making concessions on implementing project concepts may be detrimental to the overall success of the project. Concessions, alternatives, and changes to the overall land-use plan, once concluded and accepted by the developer, will clearly delay a project. It is important for the developer to assess the project costs as the design is formalized. The financial aspects of the project should be updated continuously and budgets established as the design progresses.
Changes to the plan and possible delays can be evaluated for increased revenues and decreased costs.

### 7.17 Marketing Specialists

Most master developers will include a marketing company on the design team soon after the due-diligence period is completed and the project is deemed a go. The marketing firm should be included in the initial concept meetings to obtain an overview of the project ideas and vision. A historical perspective of the property would provide additional insight on how the property could be marketed. The marketing firm does not have to be a local firm, but it should be located in the market region, so as to be aware of specific regional market preferences. The marketing discipline provides more than the “sizzle” to a project. Its input is important to balance the technical aspects of the project with the vision and sense of identity. Creating memory points and a project identity can separate a project from the competition. To market the project, the marketing firm will:

- Create an advertising campaign for the large-scale project
- Prepare community and individual land-use-pod brochures
- Create themes, identities, and color schemes for the entire project
- Model center or sales-center layouts
- Develop community signage design, locations, and message
- Conceptualize entrance statements and features for the project
- Make sales office presentation
- Design graphics for the sales office

**HINT:**

A local marketing firm would have significant local market knowledge. However, the local firm should have experience with large-scale master-planned communities. Contact the local or state home builders association to obtain a list of member firms.

### 7.18 Public Relations Firm

Large-scale projects will impact existing neighborhoods and communities. A well-balanced and well-conceptualized land-use plan should be conveyed to the community at large. Public relations firms can convey project messages to buyers, to community officials, and to the general public. A public relations firm will present a developer’s image and background to substantiate the project vision and establish credibility with
local officials. Government officials may want assurances that the land-use plan will in fact be implemented. The credibility and reputation of the developer is important in receiving a positive regulatory impression of the project. A master developer should include a public relations firm as part of the design team, and it should be tasked to manage:

- Community relations, neighborhood meetings, and public forums
- Public affairs for the developer
- Projection of the project image to the community at large
- Strategic distribution of public relations (PR) releases to build project image
- Media training for the developer
- Development of messages promoting the project
- Preparation of media kits
- Responsibilities as representative for the project

**HINT:**

A local public relations firm would assist the developer in establishing a strong local-market presence. Contact the local or state home builders association to obtain a list of PR firm members of these associations who specialize in the real estate industry.

**7.19 Architect**

The aesthetic appearance of community structures and the sense of architectural harmony throughout the project have been elevated in importance due to the sophistication of the home buying public. The overall architectural theme should be established early on in the planning phase. The nonresidential components will complement the architectural statement of the community. The housing areas may be developed as individual and distinct projects complementing the overall architectural theme of the community. An architectural perspective is essential to formulating the project appearance (see Fig. 7.7). Architects will also have input on how land-use pods should be interconnected. The architect would also prepare architectural concept plans for all common-area recreation facilities, common-area improvements, and amenity buildings. The developer may decide to have the same architectural firm prepare design-development drawings for the welcome center and sales office. The master developer should prepare extensive covenants and restrictions to be imposed upon all land-use areas. This strict guideline will provide architectural consistency throughout the large-scale project. Consideration could be given to having several architects specializing in residential design applications, commercial or industrial design programs, or common-area amenity buildings and structures.
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Figure 7.7 Architecture. Architectural control by the developer of a large-scale project is tantamount to a successful development. Developers must rely on the architect to prepare the design program and maintain design integrity for all uses.

The primary architect would also review and approve all building designs proposed by builder-developers of each individual housing pod or nonresidential component. The architectural discipline provides the high level of creativity necessary to implement the goals of the project.

HINT:

The architectural presentation of the project is a significant memory point. Retaining an architect with substantial experience in large-scale projects would best serve the project and properly manage the outcome. Review portfolios; talk with references, interview with other team members, and assess the chemistry among the design disciplines. The architectural firm should have a regional presence in the land-development industry.
7.20 Landscape Architect

The land planner for the project may be a landscape architect by education and training. If not, the design team should include a landscape architecture discipline. Landscape architects with land-development industry experience will provide a different perspective as a design team member. They have the creative insight on developing land and have the technical training to ensure that the primary infrastructure elements of the plan can easily be engineered and permitted. They also have experience in grading, pedestrian corridors, and amenity layouts. Of course, the landscape architect’s primary design strengths include selecting landscape material or the softscape design of the project. Areas in which the landscape architect may provide design concepts would include: landscaped buffer areas, entry-feature designs for major and minor access points, streetscape landscape designs, recreation areas, and pedestrian-corridor alignments and landscaping. The amenity center may also be designed by the landscape architect, including: layout, amenity features (i.e., pool and pool deck), walkway system, other recreation elements, and landscaping design for the entire amenity site.

HINT:

The landscape architect discipline could be part of a multidisciplinary engineering firm. If not, a local landscape architect would be best for the project design, since he or she would, then, be familiar with the local plant material, knowledgeable about the site vegetation, and understand the local political-approval process. Talk with local nurseries or landscape subcontractors for recommendations. The landscape architect should have significant large-scale design expertise. Review the candidate’s design portfolio. Schedule a tour of the projects the candidate has designed and constructed.

7.21 Economist

The project impacts will have political ramifications, and a proper economic analysis would provide a basis in which the project may be substantiated and receive political support. An economist would analyze the tax benefit generated by the project. Residential uses impact public services and schools, while nonresidential uses are a positive tax-ratable development. For a community seeking measured and planned growth, all uses within a large-scale project will be beneficial if political concepts and vision are considered in the plan. The economist will assess the impact on schools, fire departments, police departments, public works departments, and the ability of local government to provide other services. Most of the analysis is using available local information on schools and public services. With the base information, the project assumptions are added to the base government information to determine the level
of impact. Also the economic analysis will be completed in response to impact-fee regulations imposed at the local level.

**HINT:**

The land planner may provide the economic analysis necessary to assess the project impact on the community.

### 7.22 Traffic Engineer

Multiple land uses will increase vehicle movements to and from the site. Residential vehicle movements will be from residential areas to major arterials connecting to employment centers. Retail, commercial, office, or industrial uses included in a large-scale project will create traffic to the project from neighboring communities. The traffic generated may adversely impact the capacity of existing roads and intersections. The traffic analysis will evaluate traffic movements and recommend road improvements (see Fig. 7.8).

A master-planned community is sustainable by combining residential uses and employment-base uses. This land-use approach will be analyzed differently than the typical large residential project. This type of land-use approach also encourages pedestrian connectivity between uses, which will alter the projected vehicle counts.

Off-site road intersections may be impacted by the increased traffic. The traffic engineer will undertake field traffic counts. The land-use plan provides the road-access pattern on which the traffic study is based. The traffic analysis report should be prepared by a traffic engineering firm having extensive experience with large-scale developments. In many markets, the traffic engineer is a sole proprietor. The traffic engineer should have experience weighted toward private work rather than Department of Transportation (DOT) projects. The traffic engineer is a specialty consultant and normally is not part of a land-development civil engineering firm.

**HINT:**

In most markets, there are a limited number of firms providing traffic engineering services for the private sector. Determine the relationships these firms have with local and state agencies and assess their success at the zoning table. Interview the traffic engineer assigned to the project and assess the engineer’s interpersonal skills. The traffic engineer may have to present the report in a public forum and answer questions from government officials and concerned citizens; consequently, excellent communication and interpersonal skills are vitally important.
7.23 Water and Wastewater Engineering Firm

The impact of a large-scale community on water availability, fire flow, and water-main capabilities may be significant. The water-distribution system analysis should define the deficiencies of the existing water system. Water availability may be an issue, but generally any deficiencies can be rectified. These improvements will require funding and permitting. In many jurisdictions, the master developer enters into a developer’s agreement with the town requiring water line extension to the project. The developer will also be required to install on-site water-line systems. This type of developer’s
agreement is negotiated based on the water-design report for the entire large-scale project. The sewer-line improvements are also included in the developer’s agreement. The water and wastewater engineering firm selected to evaluate the public utility systems should have experience in water availability and treatment-plant-capacity analysis. They will also address the permitting issues and time constraints. In most cases, this design team member should be involved during the site-analysis phase to assess the impact and cost of providing water and sewer to serve the project.

**HINT:**

Meet with the local water and sewer department, and ask for a list of civil engineering firms specializing in designing community water and sewer systems. Most of the firms also work for the private sector, and their local knowledge of the public water and sewer systems and permitting process is invaluable.

### 7.24 Real Estate Agency

Developers will retain the services of a real estate agency for selling individual land-use pods. This firm may also manage the real estate sales of the land-use area retained by the developer. The real estate firm would provide the marketing and sales support for the residential project or leasing services for retail or office uses. New community land sales of individual land-use pods require real estate expertise and experience in promoting the vision of the project. Also, many land-use-pod transactions take time to close. Thus the real estate firm should be cognizant of the time and effort required to sell raw land with zoning approvals. The master developer may need to separate the real estate duties among several firms to ensure each land use will receive specialized service and attention to detail. The commercial real estate agent has considerably different experience and contacts than a residential real estate agent. Although real estate agencies, generally, are not included at the design-planning stage of a project, a developer may consider including them in key concept design meetings for local marketing perspectives.

**HINT:**

Meet with several firms and interview the agents to be assigned to the project. Interpersonal skills are important, but knowledge of large-scale community vision and concepts are equally important in conveying a message. A company with substantial years in the business and with multiple branch offices in the market area would be beneficial.
7.25 Design Team Member Summary

Site characteristics, design program, or local regulatory requirements may necessitate retaining the services of a consultant to expedite the approval process. Recreation, archeologists, and cultural consultants may be included on the design team to assist the developer on design issues, nonbuildable areas, and community impacts. Developers should expand their design team members to ensure proper expertise is available to address and resolve isolated concerns or issues raised during the inception of the project and in the due-diligence period.

Design professionals are essential contributors to making a developer’s vision and concepts a reality. The design team balances the best interests of the developer with the requirements of the jurisdiction and the characteristics of the property. The goal is to prepare a marketable, salable, and profitable land-use plan. Relying on experienced team players performing their tasks in a timely manner will reduce the number of land-use plan iterations. The final land-use plan is generated from idea building supported by a consensus of the design team members. This will be beneficial in expediting the approval process and consensus building within the community. Master developers should seek members not of the same viewpoint but having the same goals and objectives for a successful community design.

7.26 Summary

Creative design costs money. Creative design sells and markets the project. However, creativity may not be approved or permitted. The master developer needs to evaluate how each design team member will contribute ideas and resolve issues. Working together as a team rather than as individual egos will translate into a well-conceptualized, large-scale project. The result will be a profitable project approved in a timely manner.

DISCUSSION TOPICS

1. Describe the advantages and disadvantages of locating the primary amenity complex in the central part of the project.
2. List three design team members essential in preparing the land-use plan. Explain their role in the process.
3. If you were a master developer would you be a consensus builder of ideas or a decisive force, limiting brainstorming, and why?
4. How important is it to create a sense of identity for marketing a large-scale project?
Chapter 8

Common-Area Improvements and Amenities

8.1 Introduction

After reading the market study, consider the extent of the common-area improvements and amenities planned for the entire project. The improvements anticipated and designed for the entire community will have marketing, sales, and cost implications. Balancing project ideas and concepts with costs is critical to the project cash flow and presentation of the project. A land-use plan is prepared with the idea of phasing both land uses and the primary infrastructure serving those areas. Common-area improvements and amenity facilities may be sized and designed for the entire project. Even if each land-use pod will have its own amenity package, the master developer should consider a centralized amenity facility. This establishes a focal point that also creates the project identity and overall community image.

Common-area improvements owned and maintained by the community association consists of various elements. The roadways will typically be publicly owned and maintained while the entry features, right-of-way landscaping, and other hardscape elements are owned and maintained by the umbrella community association. This chapter will highlight common-area improvements and amenities found in most large-scale communities. The cost of common improvements would be borne by each land-use area, residential or nonresidential. A master developer would need to prepare a common-area improvement budget at the initial stages of developing the land-use plan.

8.2 Sales Center and Model Homes

Many large-scale communities will have a central sales center located either at the main access into the community, for visibility, or located centrally. A centralized sales center could be created for all builder-developers to market their projects.
rather than have isolated sales centers throughout the community. The sales center would also function as the welcome center for the entire community. Displays inside the welcome center could include community identity, image, background of the master builder-developer, and history of the project. The sales-center location is not an afterthought in the planning process; it is an integral component of the entire marketing plan. The sales center should be visible and easy to locate by visitors.

The central sales center should have a scale model of the community, so buyers can visualize the full build-out of the community. The model also illustrates the relationships of the land uses. Centralizing the sales-center efforts and marketing into one building brings the buyers to one location. The sheer number of people creates sales energy and excitement. The individual land-use builder-developers may not have to allocate financial resources to build their own sales office. Instead, they can concentrate their efforts and allocate cash flow to the initial phase of their development. The sales center would be included in the initial land-use area. Mixed use, office and commercial retail leasing, and sales may be included in the centralized sales center (see Fig. 8.1).

Figure 8.1 Model Center. A central model and sales center located in the first phase of construction allows all land-use pods and nonresidential facilities to be marketed from one building. A community scale model can also be displayed with the sales information provided for each land-use pod.
Having a central sales center combined as a welcome and information area would benefit buyers in their search for a home. Buyers would be directed to the each specific area within the community for specific lot selections. Each residential land-use area would be marketed from the centralized sales center but also have a model home center for that project. The model home area would have model homes with standard and upgraded features. The architectural plans for the model homes and homes to be sold will be reviewed and approved by the master developer for compliance with the community architectural guidelines. For mixed-use or high-density housing types, scale models or video presentation of the units would be incorporated in the sales-center presentation.

There is a balance in building a structure specifically for sales and the longevity or ultimate use of the building. A large-scale project will have a lengthy build-out period. Ultimately, the sales center would typically be renovated into a community center as a meeting hall or activity center.

### 8.3 Recreational Amenities

Community-identity, image, and market considerations are factors in deciding elements of the recreation facilities for the entire community (see Fig. 8.2). Jurisdictions may have an ordinance specifying the size of recreation area, active and passive, to meet the populace of the project. However, in most cases, the ordinance requirements are minimums and well exceeded by most large-scale developments simply due to meeting the demands of the market. The location of the development may also be a factor in selecting the type of recreation facilities. Large-scale communities may be designed around a golf course, lakes, mountains, or other marketable features, and the recreational features may complement the focal point of the project.

Certainly recreational activities can vary from one region of the country to the next, and a master developer should include activities patterned to each specific marketplace. Also, active-adult communities would have a different recreational-design program than other residential projects. However, there are community recreational elements common to most large-scale projects. A community clubhouse would provide central social activities as well as have active-recreation facilities.

The clubhouse facility could include:

- activities room
- association offices
- ballroom or conference-style room
- billiards and ping pong
- business center
- card room
- card room
- computer room
Chapter 8 Common-Area Improvements and Amenities

Figure 8.2 Recreational Facilities. The developer needs to decide up front whether to construct a common recreation facility or require each housing project to have its own recreation amenity. A central facility is an excellent marketing tool and adds value back into the individual housing projects by having more buildable area.

craft room
day care facility
exercise room with equipment
group exercise room
gymnasium
indoor swimming pool
indoor track
library or reading room
locker rooms
meeting rooms
multiactivity court
solarium
The selection of recreational elements should be consistent with the market segments and project location. For move-up markets, two separate recreational amenities may be required for young families and an upwardly mobile market.

The size of the project, configuration of the property, or land form may necessitate having more than one community clubhouse. Many active-recreation ideas can be integrated into the clubhouse community site or strategically located within the project as satellite recreation areas (see Fig. 8.3). The active recreation components are market sensitive and strategically designed for the marketplace by the design team.

Active recreation ideas could include:

- basketball courts
- bird-watching stations
- bocci courts
- children’s playgrounds (or tot lots)
- climbing walls
- community garden plots
- cookout areas
- golf course
hot tubs and spas
lake access for boating and swimming
nature trails and hiking
obstacle course
outdoor pools, including wading pools
outdoor track
paintball field
picnic areas
shuffleboard courts
skateboard tracks
soccer field
softball and baseball fields
tennis courts
volleyball courts

All of the components would be considered for market appeal, governmental acceptance, and costs. Many open-space areas can also double for other recreational uses. Properly locating the recreation uses within the community is important for accessibility by the residents and for the visual enjoyment of all. Consideration could be given to transforming common open-space areas into spaces for passive designed uses. For example, nature walks, pathway system, hiking trails, sitting areas. This would be especially appropriate for flood fringe areas and dedicated open-space areas massed throughout the community. Soccer and other field sports do not require permanent fixtures and are best suited for open-space areas.

The recreation and clubhouse facilities would typically have a separate budget and cost analysis prepared during the land-use study preparation. Many of the recreational uses will influence the land-use allocation of property and their locations. The design team will be preparing a preferred list of recreational uses, selecting locations, defining the magnitude of each recreational use, and estimating the cost of each feature. This initial cost analysis will be monitored and recalculated during the land-use plan approval phase and each subsequent design phase of the project. The cost allocations to specific land-use areas will be continuously assessed by the master developer to ensure the cost is recaptured as the project moves forward.

8.4 Pedestrian Connectivity

Providing pedestrian access routes from residential uses to the nonresidential or active recreational uses is an important element of design (see Fig. 8.4). However, this would not replace the need for jogging or running paths, walking trails, fitness stations, and/or bike paths designed with the infrastructure layout or designed as
separate features meandering throughout the community. Pedestrian connectivity and designing for pedestrian traffic should be the norm rather than concentrating on automobile movement. Separating pedestrian traffic from vehicular traffic should be a goal of the overall land plan. If mass transit is incorporated into the community design, with stations or carpool parking areas, pedestrian linkage to the residential areas would also be considered a positive attribute of the project.

Bike paths or lanes can be added to the typical roadway section. The width of the roadway section would be expanded for a 2- to 3-foot bicycle lane. This would typically only be associated with the collector functioning roadway. At major intersections, bike lanes would also be striped with the pedestrian crosswalks. Within the residential housing areas, roads designed for traffic calming would also allow for car, bicycle, and pedestrian mutual use. The interior pedestrian-pathway system will vary in width and surface material. The interior system may be included in dedicated open-space areas within casements. There should be consideration for pedestrian amenities including
rest stations, benches, and water features. It would not be uncommon for the path to be 3 to 5 feet in width and have an asphalt surface. The long-term maintenance of the path system would be included in the umbrella community association fees, and an asphalt surface provides a more maintenance-free system. It is also user friendly. Separate hiking trails or nature walks would typically not be paved and would be located adjacent to tree-save areas, wetland areas, or floodplain locations.

8.5 Architectural Themes and Materials

A key member of the design team is the architect. This discipline would not only prepare working drawings for the common area buildings (i.e., the clubhouse), but they will also provide design guidance. The master developer will be creating an architectural theme through design concepts, use of building materials, and colors. The architect will assist in establishing the design concepts for the common-area buildings and facilities. These concepts would then be used as a guide for the residential and nonresidential uses. Both residential and nonresidential architectural designs should be presented at every forum held to debate and discuss the project during the regulatory process. Architectural design considerations and guidelines are created at the inception of the land-use plan. Orientation, residential scale, height, and mass should be considered for buildings adjacent to major access points and primary common amenities. The architectural theme is duplicated in nonresidential areas through the use of building materials, color schemes, and textures. The nonresidential buildings should consider varying building heights within the same structure, altering roof pitches or forms, and building facade offsets. Design sells. Master developers will consider architectural approaches for all of the land uses, including (see Fig. 8.5):

- **Orientation**: Building frontages oriented toward the street while locating parking and access drives to the side and rear of the site. This orientation would create pedestrian linkage from the street walkway system rather than have pedestrian traffic walk through a parking lot. The location of the delivery, storage, service, and dumpster areas located and screened from the primary roads and pedestrian traffic. This would separate the delivery truck traffic from the public access. Mechanical equipment should be located for blending to the architecture or appropriately screened from the public. Nonresidential uses should provide pedestrian-oriented layouts and landscaping features, including softscape and hardscape elements coordinated with the building program. This would include signage, site lighting, benches, pavement textures, and enhanced natural features.

- **Materials**: Building materials selected should complement the architectural theme selected for the community. Avoid drastic dissimilar materials in setting the guidelines for the project. Maintenance or longevity criteria should be used in selecting materials conducive to the local climate. Material textures will also provide architectural variations to change aesthetics, that is, stucco or brick.
8.5 Architectural Themes and Materials

Nonresidential uses should also be held to a high architectural standard consistent with the overall community design program. Proper use of materials and colors will complement well-designed buildings, creating a destination point.

- **Color**: Select a color scheme that will stand the test of time. Most large-scale communities will require many years to complete, and identifying with a community theme must sustain its appeal. The market acceptance of nonmainstream color schemes should be factored in the selection of the project color combinations. Brochures, marketing campaigns, signage, and building architecture would all be based on the project color scheme.

- **Design**: Architectural design elements will differentiate a project from the competition (see Fig. 8.6). Attention to detail and design features incorporated throughout the project will create a sense of belonging by visual representation. Design elements for consideration: building offsets, window style, door style, roof pitch, shingle selection, roof form, building massing, varying roof heights, varying setbacks, reveals, overhangs, awnings, building lighting fixtures, walkways, and landscaping. Building-entrance designs and pedestrian-circulation patterns within nonresidential-use areas should also be considered in developing design guidelines for the project.

![Figure 8.5 Themes and Building Materials. Nonresidential uses should also be held to a high architectural standard consistent with the overall community design program. Proper use of materials and colors will complement well-designed buildings, creating a destination point.](image-url)
Figure 8.6 Mixed-Use Design Features. Town centers should be designed for pedestrian and street-scene aesthetics. Attention to architectural detail and creative design will make a difference in consumer acceptance.

8.6 Hardscape Design Features

These features can be found within a site regardless of use (see Fig. 8.7). Hardscape elements can be stand-alone structures, poured in-place, or unit-placed material. Stand-alone features may include street lights, parking-lot lights, pedestrian-walkway lighting, gazebo-meeting areas, fountains, flags, banners, and benches. Poured-in-place refers to asphalt or concrete material. Stamped concrete or stamped asphalt pavement could be designed at roadway intersections, crosswalks, or residential land-use entrances. Changing the road pavement texture will provide a sense of arrival.

Stamped concrete may also be colored, while the stamped asphalt could be overlaid with a tennis court–surface coating. This is best suited for pedestrian crosswalk areas. Sidewalks and pedestrian pathways may also be treated with different surface textures and colors. In lieu of poured-in-place material, hardscape features may include brick, stone, or concrete pavers. The unit-placed material may be designed for roads, sidewalks, and parking areas. Also, road curb styles may change and edging
curbs added along landscape areas and pond edges. The use of retaining walls may also be needed to maximize buildable areas while adding a hardscape design elements. There are alternative material selections for retaining walls and selections based on application and location.

8.7 Softscape Design Features

The landscape-design approach should be formalized during the due-diligence period. During the initial site inspection, assessment will be made to the quality and quantity of the existing vegetation and trees on-site. During the land-use planning phase, the landscape architect–design team member will influence and guide the planning process, complementing the existing site-landscaping material. The approach to supplement existing vegetation with new landscaping material has always proven successful. Existing specimen trees, specific tree species, and understory plantings should be used in the overall planning of the project.

Areas of specific attention would be buffer areas along the perimeter of the property, the frontage roads, and the primary access road. Specifying large caliber
Figure 8.8 Landscaping Features. Frontage road landscaping may consist of mounded areas landscaped, irrigated, and with perimeter walls or fencing accenting the entrance statement. Developers should also consider landscaping boulevard medians and along road rights of way. Trees in highly visible areas will add a more instantaneous maturity to the project. Landscaping frames the building architecture and helps direct the eye of the buyer from buffered areas to high-profile elements of the project (see Fig. 8.8). It is common to specify 2½ to 3 inch caliber trees for the entrance features, amenity, clubhouse, main boulevard street trees, and the town center area. Buffers along the main “marketing window” should be a combination of existing vegetation, new landscaping material, and hardscape elements (i.e., fencing, lighting, and signage).

Consideration should be given to a tree-transplant operation and moving existing mature trees to highly visible strategic locations within the community. Locations could include the main entrance, main property road frontage, amenity site, and the town-center area. The cost benefit of moving the existing mature trees to obtain instant maturity is cost effective and the survival rate is excellent. Landscape designs should also focus on major intersections. The selection of the plant material can define the hierarchy of roads, different land-use projects, and road-access points. Landscape-design considerations include: selection of trees, shrubs, ground covers, turf, and flowers. Irrigation and landscape-lighting features should also be included in the common-area landscape design. Long-term maintenance, color, mature height, and mass of landscaping are all considered in preparing a common-area landscape plan.

The master developer should also consider establishing a minimum requirement for house landscape packages in the residential-use areas. The residential-landscape packages should also be planned for the different house orientations. The landscape architect will also design the softscape for the clubhouse, recreational areas, and the model homes. The nonresidential-use-area landscaping design should be approved by the master developer and the landscape architect design team member.
8.8 Entry Features and Signage

Initial impressions significantly influence buyer’s opinions of a project before they even enter the sales or welcome center. Creating a memory point at the entrance is an excellent marketing and promotional tool. Entry features should be inviting and be the *front door* to the community. A large-scale project provides the opportunity to spread costs over more units and nonresidential uses. Design is always balanced by costs. The design team should have a clear understanding of the budget parameters the master developer has assigned to various common elements.

The entry feature does not have to be over the top, and simple elegance is timeless (see Fig. 8.9). Designers need to also consider the continuous maintenance requirements of the entry feature—for the longevity of the build-out and beyond. Consideration should be given to the proper selection of the construction material, colors, and plant material. There are instances when the entry feature will be designed to enhance the theme of the project. As an example, a project named the Villages of Charcoal Mill might have an operational waterwheel as the entrance feature. This

![Primary and Secondary Entry Features](image)

*Figure 8.9 Primary and Secondary Entry Features. The entry feature located at the primary access to the community should be duplicated at secondary intersections. These features would not be as elaborate as the primary entrance statement.*
Design components of the entrance should be extended along the frontage road, which is the marketing window for the project. Announce the project before the entrance with design elements, including signage. The design elements could be intermittent stone or brick columns, fencing, berms, lighting, or landscape material patterned after the entrance feature design. Perhaps a water feature permitting a visual opening into the project will announce the project. Perhaps a golf course hole close to the property boundary may be sufficient.

Proper signage is also important throughout the community. A community directory is beneficial to marketing and announcing the total extent of the project. Intersection monumentation and design consistency of individual project entrances will enhance the sense of belonging to a larger-scale community. Street-sign styles and specifications should also be discussed with the design team. If street signs have to comply with typical metal signs, the sense of identity and creativity will be lost. An alternative design approach should be presented to the approving agency. The

Figure 8.10 Common-Area Budgets. Hardscape and softscape amenities are necessary for visible finishing touches to a creative site. The cost of these facilities can be easily managed. The marketing benefits and the enhancements to the site environs far outweigh the cost.
attention to detail will make a difference in market presentation and market acceptance (see Fig. 8.10).

8.9 Cost Considerations

Common-area amenities, passive- and active-recreation areas, and common-area improvements will be constructed by the master developer and have separate project budgets. Entry features should be separated from the clubhouse budget and other common-area elements. This would highlight the financial commitment to each improvement and be entered into the cash-flow analysis for the entire project. In establishing a budget for each common area improvement, the master developer will obtain a sense of the total cost and also provide guidance to the design team members. Design is a function of creativity, practicality, and vision—but with a price tag. The budget process at the design phase provides proper parameters in which the design team must function. It would not be acceptable to provide a financial guideline, and after the working drawings are complete realize that it costs too much or cannot be built. Designers will always push the envelope with nice-but-not-necessary concepts. The developer should be monitoring the design and cost as the ideas are implemented. Included in the design versus cost analysis, the master developer should evaluate different perceived-value concepts for the design. Perceived-value ideas appear more costly than the actual cost. The design team members will have a list of ideas and concepts for consideration. It is important for the master developer to agree with a design program and then stay with it. When the ideas are established but then modified due to reducing costs, the final result will appear suspect and shortchanged. Master developers should establish the budget, monitor the design, and assess the cost on a continuous basis.
8.10 Summary

The master developer supported by ideas from the design team will establish a pattern of development. This pattern should be consistent with the demands of the marketplace. Common-area improvements and amenity packages will establish the marketing image or community branding of the project. There is a fine balance between not having sufficient community attractions or design elements and allocating a disproportionate amount of financial resources to constructing common-area improvements and amenities. During preparation of the land-use plan, the master developer needs to continuously monitor costs and the design program. There definitely is a relationship to the cost of building amenities and common improvements to the perceived value of those facilities. The master developer should orchestrate the design team to achieve this balance so the design concepts are budgeted properly and constructed within the financial constraints of the project.

DISCUSSION TOPICS

1. Explain the importance of pedestrian connectivity between residential and nonresidential uses.
2. List the advantages and disadvantages of including a golf course as an integral component of a large-scale project.
3. List common-area improvements that have perceived value.
4. Should the master developer have architectural review and approval control over all construction of residential and nonresidential uses?
Chapter 9

Government Agencies
and the Approval Process

9.1 Introduction

The land-development industry is a fragmented industry, and each municipality has its own regulatory process, permitting requirements, and development standards. It is not uncommon to also have conflicting requirements between local, regional, state, and federal reviewing agencies. The industry is influenced daily by local, politically shaped points of view that reflect how, how much, where, and when development will occur in a specific jurisdiction. Unfortunately, the regulatory climate is forever changing, reflecting the pace of development pressures. Intense pressure to develop land in their communities causes governments to react to building pressures, ultimately swinging the pendulum from a pro-growth attitude to a no growth sentiment, showing the direct influence of the general public. It is clear, however, that most local municipalities will favor well-thought out and conceptualized master plans over leapfrog subdivisions. Developers’ would have a better chance to influence the overall outcome of a project by sharing in the vision of the municipality. A master developer achieves successful milestones as the elements of the large-scale development are conceptualized. Local government becomes a valuable team member rather than an adversary during the concept planning phase of the project. Working together to achieve a balanced residential and nonresidential plan benefits all vested interest groups. Growth can be better managed in a master-planned community, which would translate it into a sustainable project.

9.2 Master Plans

Community planning includes the preparation of a master plan or comprehensive plan that encompasses many elements guiding development patterns and land uses for the community. A master plan sets a policy on how the community will grow and
develop in the future. The master plan is established by using resource information on demographics, natural resources, existing public facilities, land-use patterns, and transportation corridors. This overall community guide is a vision that governs how private and public activities are implemented within the community.

The intent of this book is not to analyze nor pass judgment on efforts of governments to legislate how their citizens should live and how a community should grow. The profitability of a large-scale project is influenced by many factors, but certainly time has a significant impact on the measure of success. Master developers should recognize the importance of partnering with local politicians and agency staff members during the conceptualization and visualization phases of their project. Bringing government along with the planning of a project tends to answer questions and solve problems before public forums are scheduled. Having regulatory input at the beginning of the land-use planning phase is beneficial in expediting the project, establishing objectives consistent with the community master plan, and creating land-development standards mirroring the overall project design approach. The community master plan adheres to local political sentiment, and a master developer should work within the community guidelines. The land-planning process for a large-scale project is open for subjective review by many entities. Thus, expediting the review process at the beginning will affect the entire development-process timeline. To accomplish this, the master developer should work closely with the community and public to reach a consensus and an understanding about how the project will be built. In most markets, government agencies significantly influence the development patterns of large-scale projects. Thus it is in the best interest of the master developer to work with local government in preparing a plan authored together.

9.3 Zoning Plans

Based on a community’s master plan, local governments will prepare a zoning plan that distributes the various residential and nonresidential zoning districts throughout the community boundaries. All communities with established zoning districts have the objective of protecting the health, safety, and welfare of the public. Their intent is to guide development patterns supporting the overall comprehensive plan for the community. In many instances, large-scale developments will encompass multiple parcels of land and bridge over multiple zoning districts. In some locales, land may be zoned agricultural, which would necessitate rezoning to a specific zoning classification.

However, in most cases, property consolidation and the land-use plan would be used as the rezoning document by local government. In preparing the master plan, the zoning classifications should be consistent with existing definitions, density values and permitted uses for the various zones already created by the jurisdiction. Most zoning districts established in the community will be formalized specifically for that jurisdiction and may not be consistent with adjacent municipalities. Large-scale master plans should also be consistent with local ordinances but seek flexibility to adjust for market variations and innovation. Many communities have established a
planned-unit-development zone that is intended to provide prescriptive standards. Many jurisdictions, however, do not have planned-unit-development zones nor do they have regulations encouraging flexibility and creativity in land-use planning. In fact, many jurisdictions have antiquated zoning ordinances that encourage leapfrog development patterns rather than master-planned communities. Thus, in many instances, the master developer is required to establish a land-use plan for regulatory review, zoning approval, and public scrutiny. Although this will add to the timeline and have budgetary consequences; the results will be beneficial to the community as a whole.

9.4 Political Considerations

Nationally, over 40,000 political jurisdictions influence how, when, and where development occurs. Each jurisdiction has a vested interest in controlling and guiding development patterns in their community. A large-scale development plan would complement their efforts to achieve a cohesively designed community. Local politics is one of the most important factors influencing the development process. The range of political views is jurisdictional, and what happens in one community does not always translate to adjacent communities. Politics and public sentiment are not always factually based but, at times, inspired by emotion of the subject and reacting to development pressures. Well-planned large-scale projects are also welcomed, even in no-growth communities. Balancing residential and nonresidential uses and directly addressing political hot buttons in the large-scale land-use plan will be well received. Obtaining local political support is crucial to the overall timeline for the project. Most local politicians and planning or zoning board members are long-standing members of the community. They have established viewpoints on their idea of well-planned developments. Developers need to understand and appreciate their community insight.

Master developers will receive a better political reception if the political hot buttons are incorporated into the overall master plan. “Hot buttons” are community needs or requirements imposed during the regulatory process but which are not a part of a particular ordinance. After all, a large-scale development is a consensus-building exercise driven by market, ideas, and cost. The local political force will influence the outcome of the ideas implemented and the cost of developing the project. A project does not create the market; a project is in response to demands of a market. If the market profile for housing, retail, office, recreation, and other uses is in conflict with political concerns, the master developer should assess the strength of the political will. The more a community leans toward no-growth initiatives, the more debate and cooperation tend to dissipate. Understanding the political climate and assessing common goals during the initial land-use planning phases is important to staying on schedule and within budget.

Master developers must seek a resolution of their land-use plan from local government. By asking government to pass positive judgment on the plan, political forces request the developer to address community wide issues. Understanding the
magnitude of these issues and the cost ramifications will provide a framework in which to base a go-or-no-go decision during the regulatory review process.

9.5 Regulatory Staff Influences

Regulatory reviews at the local level are either performed by employees of the municipality or outside consulting firms. In either case, each reviewer will undertake the review in accordance with the standards, criteria, and ordinances of that jurisdiction. However, the reviews in most cases extend beyond the intent of the ordinances and become individualistic in nature or politically influenced. Knowing this is common within the industry, the master developer and the design team should meet with the regulatory reviewers to understand their viewpoint on development practices and how they may react to the land-use plan proposal. Many jurisdictions have prepared plan-review checklists, which are used by reviewers to ensure consistency during the review process. The design of the infrastructure by the civil engineer will require government agencies to review the plan for regulatory compliance. Also, the review will encompass the operation and maintenance aspects of the project once the jurisdiction accepts the infrastructure from the developer.

There also may be conflicting regulations between agencies, and resolution of those issues must be resolved. Storm-water management, storm-drainage design, and best management practices are design issues reviewed by multiple regulatory engineers. It is incumbent upon the engineering design team member to know the engineers reviewing the plans at each level of regulatory scrutiny. Conflicting regulatory-design requirements may need to be negotiated or arbitrated between agencies. In some instances, the master developer is put in the middle of conflicting agency requirements and must intercede to keep the project planning moving forward.

The land-use plan will be reviewed by regulatory planners seeking consistency with the community master plan and adjacent zoning districts.

9.6 Local Agencies

Large-scale master-plan proposals will initiate wide-scale regulatory reviews from local, regional, state, and federal agencies. The land-use plan and land-development construction drawings will be reviewed for regulatory compliance by various agencies. Each jurisdiction will have its own regulatory-review process. But many of the following agencies may review project development plans.

Planning Board

The planning board may be an advisory board, or it may have powers to approve or deny development applications. In either case, the members of this board are typically appointed by the governing body of the jurisdiction or designated by the mayor. In some jurisdictions, the mayor also serves on the planning board as a voting
member. The board members, as political appointees, have ideals and goals reflecting the development sentiment of the politicians in power. The board is established to review development applications having designs completed in accordance with local ordinances. Many planning board members are not trained in the development industry and must rely on board professionals for direction and advice.

However, the board members must vote on the merits of the application and pass judgment on any issue specifically relevant to a large-scale master land plan. The vote in most cases must be a simple majority of the board members present. Some jurisdictions divide their community into districts. Each district is represented on the planning board. This organization permits district representatives to decide on the merits of each project proposed in their district. Residents of that district assess the pros and cons of the proposed project. This arrangement provides a system of specific interest by a board member to ensure the application is sensitive to the residents of that specific district. This also helps limit general political influence during the approval process.

In many locales and under extreme or unusual conditions, the master developer can only appeal a planning board decision to the courts. In other municipalities, an appeal could be heard by the town council or governing body of the municipality.

**Zoning Board**

Large-scale projects that consolidate various parcels of land to amass enough property to prepare a master land-use plan may be required to submit their application to a zoning board (see Fig. 9.1). This may be required because various parcels may have different land-use designations and zoning classifications. This requires a rezoning of the property. A zoning board, zoning board of appeals, or zoning board of adjustment is established locally to regulate the use of land and buildings by enforcing the zoning laws of the municipality through a zoning administrator. The members of the zoning board are residents of the community and are appointed by the mayor, and they act on the rezoning application.

Residents, developers, and builders may seek an exception to the zoning laws, or they may appeal the decision of a zoning administrator by applying to the zoning board. The board is empowered to review and act upon requests that are not consistent with the current zoning requirements. The zoning board will have a structured process for application procedures, notification requirements to adjacent neighbors, specific hearing criteria, voting rules, and an established appeal process available to those deemed harmed by the decision of the board on a specific application. It is incumbent upon the applicant to prove that the variance to the zoning laws will not be inconsistent with the intent of the zoning laws and that the health, safety, and welfare of the citizenry will not be jeopardized. Many jurisdictions will require an applicant to prove that the proposed variation will be beneficial to the town and serve the overall public good. The applicant should also prove that the benefits of the change from the zoning laws will outweigh any detriment to the public good.
In terms of a large-scale development, the master-planning approach provides significant reasons for a local board to approve a comprehensive land-use approach that has vision and is consistent with the intent of the local zoning ordinance and community master plan.

**Town Council**

Again, the regulatory process established to review and approve developments for construction varies from town to town. In some instances, the planning board is an advisory board making recommendations to the town council for approval or disapproval of a development application. This establishes a two-tier local approval process, with both open to public scrutiny. The town council is not bound by the actions of the planning board and will act independently with input from all agencies. Since the housing industry is fragmented along the lines of local governments, consistency in the development-review process does not exist. Local politics remains the most important intangible affecting the development process.
As with the zoning and planning boards, the town council will have specific monthly meeting dates. Typically, the applicant must submit a specific number of plan sets to the town fifteen days prior to the council meeting date. This period is for public notices and plan review. Because of recent development pressures, an application may take several months before it is placed on an agenda for consideration. The master developer needs to understand local government’s ability to manage the application process thoroughly and efficiently.

**County Planning Board**

The local, municipal land-development review process relies on a variety of other local, regional, state, and federal government agencies to review the design plans. Most local municipalities establish approvals by outside agencies as a condition to the approval of design-development plans. The approval process may include submitting the land-use plan and construction drawings to the county planning board for review and approval. The local land-development ordinance would indicate the county planning board as an outside agency and requiring the applicant to obtain its approval. In some jurisdictions, the county becomes involved if the local municipality does not have the staff to review development plans and the county agency is contracted for review services. In other instances, the county becomes involved if the proposed development will impact county drainage facilities or impact traffic conditions on existing county roadways.

For a large-scale development, traffic has a key and direct impact on existing facilities; having the county review the plans is typical. In most cases, the master developer will submit the land-use plan or construction documents simultaneously to the local and county agencies. County government will also have their own growth management and master plans for the overall planning of a larger geographic area.

**County Commission**

Similar in organization to a town council, the county council or commission positions are won in a general election. The county commission is the governing body overseeing development projects located only within county boundaries and not located within any other municipal boundary. In some instances, there may be a duplication of the approval process, with both the county and local political bodies reviewing and approving the development project. And, in some cases, the standards and criteria governing the design and construction practices may vary between the two. Resolving conflicting standards becomes the responsibility of the master developer, and it is usually accomplished through negotiation.

**Redevelopment Board**

In areas around larger municipalities, local government may establish a redevelopment zone overlaying existing zoning. This is to establish new development patterns
and to embrace new ways to energize the local economy and encourage new enterprises in blighted areas. If the large-scale project will be accessing existing infrastructure and facilities, the master developer needs to determine if an overlay zoning district exists and assess the impacts this zoning will have on the project. This overlay zone may hinder a developer from designing the project to meet market considerations and the project developer’s vision. However, if the developer agrees with the redevelopment-plan approach for the property, they can also work in concert with local officials in expediting the approval process. The master developer may also work closely with the local agency to balance the residential and nonresidential uses to ensure the project is profitable. Having local government support for a project in a redevelopment zone should not be discounted, as this alliance may expedite project approval.

Public Works Department

The public works department will be responsible for the engineering review and approval of land-development projects including master-planned communities. Their land-use plan input will be an overview of transportation links, assessments of traffic concerns, reviews of storm-water management practices and best management practices, water lines and sewer facilities. The public works department will also focus on the operation and maintenance of the proposed infrastructure and facilities. Many jurisdictions have professional engineers on staff to review proposed development plans. In other cases, municipalities retain outside consulting firms to undertake the engineering reviews. In either case, the master developer and the engineering design team member should meet with the department to gain a better understanding of their review process and design preferences. Ask for a copy of the detailed review checklist used by reviewers of engineering plans. Also schedule a meeting with the reviewer once the review comments are issued. The meeting will clarify any ambiguities and provide a forum to discuss any major issues.

Fire Department

Over time, the fire department has become very active in the establishment of land-development-design criteria, including road widths and fire hydrant locations. Many jurisdictions require the fire department to sign off on the plans as a condition of planning board approval. The fire department will review the land-use plan for road layout, typical road sections, cul-de-sac designs, connectivity, water pressure, water availability, and fire hydrant locations. They will also review road names against existing road names to eliminate duplications or similarities in names. Fire-protection service review is essential to the proper build-out of a mixed-use project. Architecture, material selection, and building heights should also be discussed with the fire department. In many instances, the department may not have any problems with the developers design approach, but it is better to obtain this level of assurance early in the design process. A large-scale project may necessitate significant off-site waterline or water-supply
improvements or even dedication of land for a fire station within the proposed project boundaries. Since the fire department addresses life-safety issues, the master developer must seek an alliance with the fire department to design an acceptable project.

**Police Department**

Many jurisdictions are also asking police department personnel to review the road-network layouts, response times, and street addresses. They will also assess their manpower needs and servicing requirements for the new project. In some cases, the street-lighting criteria used for the project will be reviewed for coverage and safety. Master developers should meet with police department representatives prior to initial land planning. The location of the proposed project, size of the project, mix of uses, and existing level of service provided by the municipality are considered in determining if the current police force needs to expand.

**Emergency Management Department**

Large-scale projects designed with various land uses reinforce the concept of living, working, and shopping within the community. The project also becomes a point of destination for those living outside of the project area. The emergency management department will assess emergency routes and traffic control needed to serve the proposed population. Generally, proper land-planning techniques and land-use distribution will account for fire, police, and emergency management considerations.

**Environmental Commission**

In many cases, the environmental commission is an advisory group to the planning or zoning boards. Their input is provided to the master developer, and many commission members attend public hearings to voice their concerns or recommendations. The commission members are appointed by the local governing body, and most members are knowledgeable about environmental issues but are rarely considered environmental experts. The environmental commission’s level of influence is dependent upon the political support provided them. For a large-scale project where environmental areas are taken into design account and where environmental issues are properly addressed, the environmental commission should become an ally.

If environmentally sensitive areas, plants, or species are not duly considered during the planning process, the environmental grassroots groups will elevate the project into an adversarial atmosphere. State environmental laws and regulations have progressed significantly, and developers must recognize that environmentally sensitive areas may be a benefit to the overall plan rather than a detriment. Many developers educate environmental commission members with the proposed land-use plan. Meeting with the commission during the planning process is also recommended. The general public will target environmental issues, such as wetland areas and floodplains, as critical issues. Large-scale master plans have the benefit of being considered environmentally
conscious while maintaining a residential density and nonresidential balance for a profitable project.

**Shade Tree Commission**

A shade tree commission may be established by the governing body. They have the sole responsibility of reviewing development plans in accordance with local landscaping ordinances. The ordinances will limit the commission authority to an advisory role while other municipalities will provide staff for the commission and expand its authority. This group will walk the project property and locate any trees of significance. Each community will have a different definition of what *significance* means (see Fig. 9.2). However, many municipalities will consider trees of 24 inches in diameter or greater to be trees of significance. Aerial photographs can be used to locate groups of trees to be considered for preservation. Existing tree ordinances require developers to field survey certain sizes of trees. For large-scale projects, a complete field-tree survey would be impractical and cost prohibitive. Thus, in most

![Figure 9.2 Community Hot Buttons. Unwritten political objectives designed to enhance the existing community through developer concessions at the zoning table. Developers of large-scale projects will succeed with a consensus-building approach to the process.](image-url)
instances, the developer may substitute a sample area (of 100 feet by 100 feet) as representative of the vegetative areas within the site. Once the land plan starts to take form, the master developer should have the primary road centerlines staked in the field. The design team members should walk the centerlines to determine if the quality of the existing vegetation located in the road right-of-way would necessitate a shift in the road alignment to save significant trees.

A shade tree commission may also become involved in reviewing the landscaping design for common areas, amenities, and street rights-of-way. The selection of the proper tree specie and size should be in accordance with the local ordinance. Developers’ landscaping approaches for their projects far exceed the requirements imposed by local government. Even with an upgraded landscaping approach, the commission may review the design and offer comments or alter the design as they see fit.

**Cultural, Historical, and Archaeological Commission**

Many communities have established commissions to designate historical buildings or properties having cultural, historical, or archaeological significance. For a large-scale project containing many acres and spanning over multiple properties, there is always the possibility of having a building or an area regulated by this commission. It is also possible that an area within the project boundary may be evaluated and considered by the commission as an area to be protected under their designation guidelines. In some cases, ordinances may require buffers or permit the transfer of development rights in order to protect the designated area or building. Historical structures or areas of significant value may affect the land-use plan by its location or size. However, the impact may be positive if it can be incorporated into the land plan and marketed appropriately. There may also be a tax benefit to the property owner.

**Water Utility Department**

Water mains and supply systems within a jurisdiction may be governed by either a municipal water department, a quasi-governmental entity, or a private water company (see Fig. 9.3). In either case, the master developer must seek approval for water service to the proposed master planned community. Issues concerning supply, pressure, and existing distribution-line locations must be evaluated during the due-diligence and land-planning phases of the project. Off-site improvements may be required to service the project. Additional permitting by state agencies may be triggered by the magnitude of the project water demands. Discussions about water service should be ongoing, and they will most likely change as the land-use plan is conceptualized and finalized. The number of residential units and nonresidential uses will revise the total water demand of the project.

Many municipalities will require a developer’s agreement for water service as a condition of the land-use plan approval. The developer may determine that an off-site water utility improvement will provide service to a greater area than the specific project. Thus, there may be an opportunity for a cost-sharing plan with the
Figure 9.3 Water and Sewer Agencies. Without public water- and sewer-facility capacity, a developer must budget for significant costs for line extensions, plant expansions, or water-storage facilities. Utility infrastructure improvements may not be the critical path but will be the critical issue that will be most deeply analyzed during the due-diligence period.

municipality. The regulatory-review process of the water-distribution-system design will vary considerably between agencies. Water lines are generally aligned within road rights-of-way. The processing of the water-design plans is generally not the critical path in the permitting schedule. Existing water supply and water pressure are monitored by local agencies, and most jurisdictions continuously upgrade their water system to keep pace with development patterns. Most jurisdictions are proactive in addressing the demands on the existing water facilities. The system must be adequate to protect the health, safety, and welfare of the citizens of the community.

Sewer Utility Department

Sewer lines and treatment-plant facilities within a jurisdiction may be governed by either a municipal sewer department, quasi-governmental entity, or a private sewer company. In some cases, the treatment plant may be a regional sewage-treatment-plant facility owned and operated by a regional agency or by county government. Extension of sewer lines to connect a large-scale project may require significant off-site improvements that may not follow existing road rights-of-way. Obtaining utility easements across properties owned by others may be required. Sewer trunk lines may
be located near floodplains or wetland areas that may also trigger other permitting requirements. The local regulatory agency may also require a reservation of plant capacity generally requiring fees paid in advance of construction. In many locales, the extension of sewer lines, new pump stations, or plant expansions required to service a large-scale project may be the critical path in the development process. Typically, the designing and permitting of these types of facilities is complex, time consuming, and may require multiple reviews and approvals from local, regional, and state agencies. Plant capacity to accommodate new developments is essential for a municipality to grow and prosper. Many developers of large-scale projects may consider establishing their own utility company with an on-site package plant. However, a reasonable off-site sewer extension to service a large-scale project would be cost justified. The ownership and maintenance of the system would also be turned over to the existing utility company or agency. As with off-site water systems, a developer may enter into a developer’s agreement, outlining a cost-sharing plan with other users and the municipality. Generally, the cost reimbursement is associated with the oversizing of lines or facilities beyond what would be required to service the large-scale project.

**Solid-Waste Department**

Municipal solid-waste departments typically contract out collection to private haulers. Most local and state governments have established recycling programs administered through the local, municipal solid-waste department. For the large-scale project, the solid-waste department will also review the road layout for connectivity and review the nonresidential areas for access and serviceability. Each subdivision or site plan would be further reviewed for road layout and connections once each land-use pod proceeds with design documents.

**Tax Assessor**

The municipal tax assessor will be involved in the reassessment of the property as it achieves regulatory approvals. For large-scale projects having floodplain and/or wetland areas, it is possible to obtain lower tax assessments for unusable land. The tax assessor will also be looking at the final plats for lot and block or parcel identifications consistent with their numbering methodology. Also, street addresses will be reviewed and approved by the tax assessor. Their review occurs toward the end of the regulatory process; generally, tax assessor reviews of street addresses do not cause a problem in the project schedule. However, overlooking this department will cause a delay.

**School Board**

The method in which municipalities strive to manage their school-growth needs as it relates to new housing projects varies considerably between school districts. School boards and their administrative staff are becoming more active in the land-development arena. (see Fig. 9.4). Their views and opinions on school expansion are causing
significant debate within the general public. School board members are appearing at zoning board meetings to address the impact projects have on the school system. Master developers need to make a needs assessment of existing school facilities and planned capital-improvement projects, and as well ascertain if the school system can or cannot handle an increase in school-age children. For many large-scale projects, the dedication of a school site may be required. In many locales, an impact fee is assessed to each residential lot for future school improvements.

9.7 Regional Agencies

Some government agencies have regional review and approval responsibilities for land-development projects. In many instances, the regional agencies are included in the review process of the land-use plan. And they are most certainly included in the review, approval, and permitting of the construction drawings for each individual project within the large-scale community. These agencies will have their own standards, criteria, and separate approval process, which the project design team must follow. It is conceivable that the standards imposed by a regional agency may be in conflict with local requirements. It is then incumbent upon the master developer to resolve
issues and settle interagency conflicts during the project review phase. States may have created regional agencies to regulate specific development practices in certain areas, such as coastal areas or drainage basins.

**Soil Conservation District**

County Soil Conservation Districts are part of the U.S. Department of Agriculture Soil Conservation Service (now the Natural Resources Conservation Service, or NRCS), which acts in cooperation with the state’s department of agriculture or another state department, that is, environmental or natural resources. The federal and state departments provide technical training, information, and publications for use by county officials. The soil conservation service provides a soil survey of each county and reviews development plans in accordance with federal, state, and local regulations governing land-disturbance activities. Each agency has a slightly different approach in regulating development practices.

However, each district will review soil-erosion and sedimentation-control plans for land-development activities. A soil conservation permit issued for a project is valid for \(3\frac{1}{2}\) years. Soil conservation district personnel will also field inspect the job site for compliance with the permitted design plans. The complexity of the soil erosion and sedimentation control design and review will vary between agencies, but the final engineering-construction documents should be completed before the soil-erosion plans are prepared. The soil conservation district review process has its own timetable and is not predicated on other agency reviews.

If any other agency changes the project design, these changes may require changes to the soils plan. It is prudent to receive local comments on the engineering design prior to submitting the plans for an erosion-control permit. However, many developers want to proceed with clearing and grading operations prior to receiving final design-plan approvals. The engineering design team member will assist in achieving this goal for the developer. The overall land-use plan will have common-area amenities and central infrastructure components requiring separate soil-erosion plans.

Many master-planned communities will have an absorption rate extending beyond the valid-permit period, causing the developer to have to continually renew the permit or to seek construction phasing. To increase the value of the land, the master developer may choose to provide community-wide storm-water management facilities, which would be reviewed and permitted by the soil conservation district during the initial phases of the project.

**Watershed, Transportation, and Improvement Districts**

Areas of special concern or areas with intense development pressures may overlay regional districts requiring special design considerations and separate approval or permitting requirements. It is possible for a municipality to create a special-assessment district that benefits from certain improvements within the district. If a large-scale project is within an improvement district and necessitates watershed, highway, or other
infrastructure improvements regional in nature and serves more than the large-scale project, local government may include the improvements in a special taxing district, allowing the municipality to finance the cost of the improvements over time.

Special taxing districts and tax-increment financing districts are combined public and private partnerships providing the necessary funds for infrastructure improvements. This mechanism provides local government with the means to monitor and promote growth within its jurisdiction. It also provides a means by which to ensure infrastructure improvements are built when needed to meet the growth demands of the community or land-development projects. Master developers seeking to arrange alternative financing mechanisms need to include a financial and tax consultant on the design team.

The developer must consider the benefits and timing of a private and public partnership. There are many states and local governments familiar with alternative financing approaches used to encourage sensible-growth patterns. If the municipality does not have alternative financing mechanisms in place, the developer must factor in the time and effort to achieve a practical and beneficial improvement district.

Regional Water and Sewer Agencies

Water resources and wastewater-treatment facilities may be managed, operated, and maintained by a regional agency. These agencies would control the allocation of the water availability or treatment-plant capacity. These agencies may also become involved if major water or sewer trunk lines are required to serve a large-scale project. The standards and design criteria for the trunk line facilities would be governed by the regional agency rather than the local utility department. In some states, the regional utility agency must sign off on line extensions or capacity allocations for each individual project before the state agency will review and approve the water and sewer design and allocation request.

Paying for water availability or plant capacity up front may be required at the time design plans are submitted to the agency for review and approval. To ensure utility service and availability, the due-diligence report should address these critical issues in detail so the master developer may properly budget and manage cash-flow requirements for the project.

Other Regional Agencies

Other regional agencies vary considerably in scope and responsibilities and may be established by state or local government. In some cases, these agencies will require local approval before a submission to their agency can be made. This would require the design team to understand the additional review process and standards with which these agencies will review the land-use plan. Many state overlay regional agencies cover an area of land rather than a specific issue. Thus, if the large-scale project is located within the area governed by another state agency,
the approval of that agency is separate and not contingent upon any other state, regional, or local agency approval. These agencies have their own requirements, review process, and agenda. Typically, these agencies focus on environmental issues for protection of water resources, endangered species, or land preservation. In many instances, these agencies have specific timetables in which to review and comment on plans.

The master developer must select design team members familiar with all regional agencies, their standards, application process, review process, and hot button issues to ensure the approval process progresses without undue delay. There is always a cost consideration, but generally the ramifications will be related to the density and intensity of the proposed development.

9.8 State Agencies

State Department of Transportation

Each state will have its own approach to the ownership and maintenance of state rights-of-way. In some states, all roads not specifically classified as local will be owned and maintained by the state department of transportation (DOT). In these instances, most or all subdivisions and certainly a large-scale development will require access to a state roadway and most likely require improvements to a state roadway. Each state will have its own criteria, standards, and construction practices that design plans must comply with to obtain access permits. The DOT will primarily focus on existing intersections, roadway widths, and vertical and horizontal road alignments. The impact on the existing infrastructure owned by the state is directly related to the proposed land-use plan and new traffic generated by the proposed land uses. In some cases, the master developer may have to dedicate land for an additional road right-of-way or construct a new road due to new traffic patterns resulting from the proposed land-use plan. The traffic consultant will evaluate the land-use plan, road layout, and expected traffic generated from each land use to prepare a comprehensive traffic-impact report to be reviewed by multiple agencies.

The result of the increased traffic from a large-scale project may necessitate road or intersection improvements. The cost for these improvements will be allocated by the developer to the various parcels within the project. State DOTs have specific design regulations and standards that are applied to any improvement. The agency staff will review the construction plans in accordance with the prescribed standards. If deemed in compliance, the state will issue access or road-improvement permits. The master developer should understand the DOT review process for scheduling purposes. The review time can be lengthy and may not be subject to strict timetables as required of other agencies.

State Water Supply Department

The state agency monitoring water-supply permits for land-development projects are generally concerned with projects of regional impact or those that have a
certain number of housing units. The state will issue permits for water extensions and water-capacity allocations. Water supply and water quality are significant issues facing the development industry in all areas of the country. Expanding water-supply capacity to serve a community and plan for its growth patterns is a lengthy political and technical analysis that takes time and effort. The master developer needs to assess the water supply, pressure, and quality issues at the state level to ensure the large-scale project may be approved locally, regionally, and at the state level. The state water-supply agency will have its own application and permitting process. This process is separate from the local permit process and may even be denied at the state level. State issues are not always easily resolved by financial or technical means.

In many instances, the issues are political and resolutions may cause significant delays in the project schedule. In the most extreme cases, a water moratorium is imposed and proposed building activities are subjected to waiting for an in-place solution to remedy the problem. Also, many state-issued permits have an expiration date. The master developer needs to monitor all permits and approvals to ensure the permits remain valid during the project build-out period and that all conditions of the permit have been met.

**State Sewer-Extension Permit Department**

A separate state agency may be involved in the review and approval of all sewer-extension projects. There may be established thresholds on the number of units to be served before the sewer-extension-permit process is initiated. This state agency is a self-contained regulatory review agency that may deny a project even if local or regional permits or approvals have been issued. In some states, the sewer-extension-permit process is structured to link other issues, for example, wetlands, storm-water management facilities and floodplain-management requirements. The other regulatory issues become relevant for major trunk line projects, since most alignments will be located along low areas. The state agency will require the developer to assess the impact that the sewer extension has on growth patterns, wetlands, and endangered species. The state has its own standards and criteria in which sewer lines must comply. These standards may not be consistent with local criteria, and in most cases, it is easier to design based on the most stringent criteria rather than arbitrate a technical issue between two separate agencies.

This is especially true since many local agencies have the same criteria conflicts on their own capital improvement projects. Easements, pipe material, and maintenance access are additional concerns to be addressed by the engineering design team member. Many state sewer-extension-permit processes are structured with specific-response timetables and a specific review procedure. Most state agencies will not vary or alter the process or the information required for an application to be deemed complete for review. The engineering design team member should know the state requirements, since this permit is typically the last permit needed to start land-development activities.
State Environmental Protection Agency

The state environmental protection agency focuses on clean air, clean water, and protection of other natural resources. To achieve these goals, the state agency will review and approve projects having impacts on these resources. The agency will control the pattern of growth through the implementation of development standards for water and sewer availability, storm-water quantity and water-quality facilities, protection of wetlands and stream corridors, watershed and farmland protection, and preservation of environmentally sensitive land. In some states, local land-use practices are evaluated at the state level if certain thresholds are surpassed by the proposed development design. As an example, if the threshold for a state approval is a minimum of 40 lots, a project having fewer units would not necessitate state review and approval. There are other technical thresholds that may trigger the state review process—i.e., length of sewer to be extended to the site, the gallons per capita of water usage for the entire site, location adjacent to protected waterways, or simply a project over 50 acres in size. States experiencing significant development pressures may become more intensely regulated. The thresholds may be lowered, requiring state oversight on almost all land-development projects.

In some states, the regulatory review imposed at the state level can add from one to five years of planning and regulatory permitting. Many regulatory thresholds are specific technical guidelines imbedded in a voluminous set of standards. Not only is it important for the design team members to know and understand local regulations, they must know the requirements of the state environmental protection agency. Most large-scale projects will prompt state regulatory scrutiny, and thus the design team should know the state regulations and review personnel within each agency to best serve their client. Generally, the state review will be contingent upon local approval before an application can be made to the state for review.

State Consumer Affairs Department

The building industry is typically regulated at the state level through issuance of contractor or builder licenses. Not all of the design team members are licensed. However, the consulting professionals retained to design the project are duly licensed in the state. In addition to overseeing the design profession and building community, the consumer affairs department may also be charged with the review and approval of condominium, home owner, and community association documents. A large-scale project will have an umbrella community association, and each residential land-use area will have a separate homeowners association. The nonresidential areas may also have an association for operation and maintenance of specific common area. All of which would require state review and approval of the association documents. The consumer affairs department may also be the agency that handles consumer complaints relative the housing industry.

The preparation of the community association documents should start once the land-use plan has been locally approved. The state review and approval of the community association documents would be a requirement to initiate the sale.
of properties within the project. An overall plat of the land-use areas, including common amenities, common open space, land dedications, road rights-of-way, and primary easements may be required as an exhibit to the community association documents.

**State Planning Agencies**

Many state planning agencies are charged with the coordination of planning activities established to balance growth and protect natural resources. The land-use planning objectives provide a framework in which local municipalities must achieve a balanced-growth pattern consistent with state mandates. The state planning agency will also coordinate their policies with other state agencies. This coordinated program establishes a growth and preservation pattern, directing development to existing infrastructure or certain urban areas. The state uses a wide range of data to create a land-use approach for the state. Local governments will use the state information as a basis in which to approve land-use approaches. Typically, the state planning agency is an oversight agency and not a review and approval agency. Economic development, natural features, historic preservation, public facilities, public services, land characteristics, and existing-infrastructure facilities, growth patterns, demographics, housing demand, and demand for nonresidential uses are all aspects of the development process used to define a state land-use policy and plan. In some areas, these state land-use plans are only guides, and local government determines their own growth objectives. In other states, state funding of capital improvement projects may be tied to the implementation of the state land-use plan. In either case, the master developer should determine how the state planning agency will affect the land-use plan approval process at the local level.

**9.9 Federal Agencies**

**U.S. Army Corps of Engineers**

The U.S. Army Corps of Engineers reviews permit applications associated with any proposed disturbance to the nation’s navigable waters and freshwater wetland areas. During the base map preparation, the wetland areas would have been delineated and jurisdictional streams identified prior to the layout of the land-use plan. It is best to develop a plan that minimizes the permit requests of the Corps of Engineers, primarily because of the time required to obtain permits. Most developers proceed with planning without the benefit of a Corps review. In most cases, the project can be planned with wetlands and jurisdictional streams identified by the environmental consultant. Jurisdictional stream crossings may be necessary and unavoidable for access to all areas of the property. However, minimizing the impact on areas under the jurisdiction of the Corps will assist the developer in maintaining the project schedule and limiting the added cost of adhering to Corps regulations. Each Corps district has the responsibility to process and act upon permit applications. The decision
of the district office on a permit application is final, since a formal appeal process is not available to applicants.

Thus, it is incumbent upon the master developer to select a design team member familiar with the regulations and permit processing requirements of the Corps of Engineers. Due to the level of permit activity or the complexities of the applications, Corps district responses and permit issuances may take as little as thirty days or over one year. A close working relationship is necessary between the environmental consultant, land planner, and engineer to achieve a cost-effective land-use plan minimizing the impact on areas under Corps jurisdiction.

**U.S. Fish and Wildlife Agency**

Every state has multiple identified threatened and endangered species, plants and animals, that are protected under the Endangered Species Act and administered by the United States Fish and Wildlife Agency. During the due-diligence period, research of available resources is necessary for known threatened or endangered species located on the specific site or on surrounding properties. Depending on the results of the document and field research, the specific protection rules and regulations must be evaluated and addressed during the land-use planning process.

**U.S. Postal Service**

The U.S. Postal Service (USPS) may also be involved in the overall review of the land-use plan. The post office will determine how service will be provided to the proposed project. For higher density projects, the USPS will evaluate the proposed delivery system—e.g., gang mailboxes, individual mailboxes, etc.—and the nonresidential uses will also be reviewed for acceptable means for the delivery of mail to consumers or business owners. The master developer should solicit the USPS review even if approval of the post office is not required by local government.

**Other Agencies**

Large-scale projects may also require compliance with the rules and regulations of the Environmental Protection Agency (EPA) and Housing and Urban Development (HUD). Contact the EPA for permitting and regulatory compliance and HUD for financing requirements for the project. Not all large-scale projects will require direct contact with these agencies, but their policies may directly affect the project build-out. As an example, if the master developer wants to include a HUD-backed project in the overall land-use plan, HUD will require program compliance with their rules and regulations. The Clean Air Act and the Clean Water Act, administered by the EPA, may directly impact large-scale projects based on state agencies ensuring land-development practices are in compliance with federal requirements. Federal funding of capital improvements may be contingent upon meeting the clean air and clean water standards.


Chapter 9 Government Agencies and the Approval Process

9.10 Utility Companies

Electric Company

All developments will require utility service. Utility companies will need the land uses, size of the project in area, and demands to assess the impact on the existing infrastructure. Overhead electrical lines are generally not prevalent in new housing developments except in rural areas. For large-scale projects, the electrical distribution system for the proposed residential and nonresidential uses requires the master developer to initiate discussions with the electric company for service. It is rare instance when a new project would not be served from the existing electrical infrastructure.

The electric company will require the developer to enter into an agreement for service prior to the commencement of the electrical-distribution-system design. This agreement establishes a payment requirement that in many instances is rebated to the developer once users are added to the system. In any case, this agreement will require a cash payment for services prior to the commencement of construction and generally well in advance of the final approval of the design plans. The agreement may be in place, but it many instances the electrical-distribution design will not be started until the demand is clearly identified. Thus there is a parallel design approach needed to be orchestrated by the developer. The developer also needs to review the electrical design to ensure the transformers are located in less conspicuous areas within the street scene. The conduit-crossing locations need to be reviewed for any infrastructure-design conflicts.

The typical street sections for the main boulevard, collectors, and residential streets should include the location of the electric, telephone, and cable lines to minimize conflicts with other elements of the road system. Typically, the lines are located beyond the pavement but within the right-of-way line. However, in some jurisdictions, the electric lines are located within a 10-foot utility easement running parallel to the road right-of-way. The master developer should add a provision in the agreement allowing the developer to install the conduit crossings for the electrical lines. If only the electrical company or their contractor may install the conduits, construction may be delayed. Many nonresidential uses may require three-phase power, which will require more detailed information on the demand to ensure proper electrical distribution system design.

Street-lighting design may be included in the electrical distribution system design. In some cases, the electrical company design standards may not be consistent with the local jurisdiction or with the design program prepared by the master developer. Most electric companies will include a standard light fixture and locate the light fixtures along the roadway, according to their criteria. However, many jurisdictions require streetlight fixtures to be spaced closer together, shielding toward housing units, and specific energy-saving light fixtures. The master developer may prepare an elaborate design program including streetlights, entry features, signage, amenities, and pedestrian pathways.

In many large-scale projects the lighting fixtures become a design element that enhances the overall presentation of the project. This may require the developer to
install all of the lighting fixtures including the streetlights. Lighting fixtures vary significantly in cost, and design team members need to balance the design themes with the cost of the fixtures.

Electric companies may have agreements with other utilities, such as the telephone company, for providing common trenching of the lines. Common trenching of electrical and telephone lines has become common practice. The master developer must not underestimate the processes that utility companies have established for planning and serving a large-scale development. The information required to assess the demand may require design-development ideas beyond the land-use planning phase and earlier than required.

To assist the developer with determining and designing for the electrical loads anticipated for the various land uses, it is important to include an architect on the design team at the initial planning stages. The electrical distribution design plan will take time, and finalization of the agreement and distribution design may be contingent upon having the land-use plan approved locally. Thus, in many instances, the electrical distribution design may lag behind the project planning and construction documentation and may hinder the start of land-development activities. During the land-use planning phase, the master developer should meet continuously with the electric company to ensure their operations correspond to the project schedule.

**Telephone Company**

The overall land-use plan must identify the total number of units, square footage of commercial, offices, and other uses so the telephone company may plan for system upgrades. There are service provider options available to developers and competitive analysis would be beneficial in providing the best service for the project. The telephone lines will be installed in the common trench with the electrical lines. Again, the developer needs to locate the installation of telephone and electric lines within the typical section of the each road type designed for the project. Typically, there is no cost to the developer for bringing telephone services into a master-planned community or development project.

**Natural Gas Company**

The heating and cooling of residential homes, businesses, and other uses will be governed by the energy source available to the location of the master-planned community. Different parts of the country will use the energy source preferred in that area. In most cases, introducing another energy source to the market may cause a negative consumer reaction to the project. As an example, if the local preferred source of energy is oil, introducing natural gas may not be readily accepted by the consumer. Natural gas companies will typically extend their lines to a project without a charge to the developer if they determine that the number of units, businesses, and so forth merit the extension based on whether it is a profitable business decision for them. In areas where the gas company may determine such an extension to be
unfeasible, the master developer may financially contribute to the cost of extension. This is especially true if the consumer prefers natural gas for cooking and heating. The natural gas company will install their lines within the road pavement area, and they will be installed, generally, after the base has been installed. The timing of the gas-line installation is important for coordination with property closings and the development activities for nonresidential areas.

Other Energy Sources

For heating and cooling, consumers may consider electricity, natural gas, propane gas, or oil. Other energy sources that will eventually enter the marketplace, requiring mass appeal, consumer acceptance, and cost-effectiveness, could be geothermal, solar, passive-solar, and wind power. Many of these alternative energy sources have been available to the consumer for years, but they have little market appeal. The technologies have not received significant research funding to perfect their applications and to initiate wide marketing campaigns. The energy issues facing the country must address alternative energy sources for residential applications. Developers of large-scale projects have an opportunity to lead by providing alternative cost-effective energy sources.

Oil

Oil has been an acceptable energy source for many areas of the country. In fact, many consumers would prefer oil over any other energy source. The pricing has always been volatile but so has the pricing of natural and propane gas. However, for oil, there are environmental concerns over buried oil tanks serving residential homes. In many states, the environmental regulations will essentially eliminate underground oil tanks for residential applications. Oil will continue to be an acceptable energy source for individual residential and nonresidential uses.

Geothermal

Geothermal heat pumps have been a proven technology for the residential market. This technology includes using groundwater as the energy source for conversion to heating and cooling by using a geothermal heat pump. It requires a supply-water well and a return well for each home. This technology is proven but not widely used, since electricity; natural gas, and oil are the preferred energy sources for heating and cooling buildings. This alternative is suited for larger lot or rural developments. The possibility of providing a community wide geothermal system may be a leading-edge application for a large-scale project.

Solar Energy

Solar energy has been serving the residential and nonresidential markets for many years. Since the 1973 oil embargo, research and market penetration for solar energy
panels and energy sources has continued to grow. However, the market application for solar energy has not received widespread appeal. Consumers of solar energy may sell back excess energy to the power company. However, until the standard sources of energy become cost prohibitive, the supply is significantly impacted, or government mandates the use of solar or alternative energy sources, this technology will be of interest but not a widespread solution.

Also, many parts of the country are better suited for solar energy applications than others. For a large-scale project, the architectural controls may either forbid the use of solar energy or severely restrict the use due to aesthetic integrity of the project. However, in California, the “million solar roofs” law requires projects containing over fifty single-family homes to include solar energy systems as an option consumers may elect to purchase from the builder. In this instance, the architectural design of the housing product must be reviewed to minimize the aesthetic impact of solar panels on the community as a whole.

**Passive Solar**

Passive-solar devices are typically located within a building structure, where the radiant heat is stored and used to heat the building. This approach requires a location, orientation, and consumer willing to have the interior design reflect a passive-solar approach. This alternative approach has limited marketability on a wide scale, but it is more suited to custom home-building practices rather than production building. It would be possible to have an estate, or residential area, within the project providing a passive solar energy–design option. Builders with passive-solar design and construction experience are essential for quality control. Such experienced builders will have warranty and consumer issues related to alternative materials, construction techniques, and energy sources worked out.

Because of specific issues related to leading-edge technologies, most builders will not attempt to include a leading-edge technology into their product selection. However, the elements of passive–solar energy should become a mainstream architectural design approach and a community-code standard imposed by local governments. The orientation of buildings during site planning will also become a mainstream design approach, dictated by local government.

**Wind**

Wind power is a source for generating electricity. The average wind speed is critical to the system design and the power generated. The wind turbine is on a tower that in most cases will violate local community height restrictions. In most cases, wind power is not conducive to urban and suburban or large-scale master-plan applications. This technology is best suited for individual homes located in rural areas. The consumer using wind power as the energy source may sell back the excess energy generated to the power company.


**Cable and Fiber Optics**

Fiber optic service is a natural fit for large-scale projects, since the planning of the project can accommodate new service lines from the project inception. Fiber optics provides the developer with tremendous marketing opportunities and provides practical applications benefiting the end user. Fiber optics has become a less expensive alternative to conventional methods such as coaxial – typical cable company infrastructure. Fiber optics provides a higher carrying capacity, allowing for more phone lines and TV channels over the same cable. Fiber optics, also, will carry high-speed digital information, which can be used for business computer networks, for a large-scale community computer network, or for use by the individual homeowner.

The benefits of a fiber optic system within a large-scale project avails cost-effective opportunities and options to individuals. The most typical means to provide television service to individual homes or businesses is through the use of a cable. It is not unusual for a cable company to install their system unilaterally in a housing project without concern for the infrastructure design. Advanced planning for fiber optics will provide a higher level quality of service to all end users.

**9.11 Approval Process**

The land-development project approval and permit-approval process is required before construction commences. This approval process is controlled at the local level. Final local approval is contingent upon the developer obtaining all other permits and approvals from all other agencies having regulatory jurisdiction. Once the outside regulatory permits and approvals have been obtained, the developer may then address the final local conditions of approval. These conditions may include posting performance bonds, submitting inspection fees, paying other regulatory fees, and obtaining original government signatures on the plan.

Each local governmental body may have its own regulatory system or relinquish this authority to another agency. But, in most locales, the land-use plan and construction drawings for a land-development project are subjected to a specific governmental review and approval process. Agency applications and review fees will also be different from one municipality to the next. The more intense developmental pressures have been in a jurisdiction, the more likely the fees will be higher and the process of obtaining approvals more time consuming. Each project will have a critical path in obtaining certain government permits.

The critical path in most instances is dictated by the complexity of the project issues and how the project will be affected by existing regulations. The more requests for design waivers or variances from local government, the longer the review process may take. In many areas of the country, agency review of project applications are not subjected to a specific deadline. However, in other areas, agencies have specific deadlines and timelines in which to review and approve a set of construction plans. In some instances, if the land-use plan or construction drawings are not reviewed within the prescribed time frame, the plans are automatically approved. In these locations,
most agencies either complete their review on time or ask for more information, which is significantly better than a denied application.

Managing the project schedule is an art that must be mastered to ensure compliance with a predicted timeline. Most large-scale projects do not meet the intended project schedule during the design and approval process, since large projects have significant regulatory and technical issues. To resolve these issues, political influence over the process must be duly considered but cannot be forecast in terms of time. Successful, large-scale project developers identify the significant regulatory issues affecting the schedule at the outset of the project. They continuously address these problems by seeking solutions as the land-use plan is prepared as the construction documents are prepared. Developers should continuously seek expertise to resolve technical issues during the review process.

Political issues need to be addressed without delay. The master developer must present solutions to avoid undue delay. Regulatory delay is more prevalent with political issues than technical problems. Developers should become active in the regulatory process. To assist in the review process, developers should recommend regulatory changes for reviewing and approving large-scale project. Developers (and their design teams) should also:

- Review ordinances governing master-planned communities and the approval process for land-use plans. Many ordinances are outdated, complex, and ambiguous. This causes staff interpretations rather than definitive decisions. Developers, design team members, and regulatory reviewers must rely on a user-friendly regulatory framework. Otherwise, delays and unnecessary costs will be incurred by the developer. Time is one of the most significant aspects of a successful project. A project delay may cause the developer to be in violation of the land purchase contract, affect the financial agreements, add more interest costs, cause the work force to seek other opportunities, miss advantageous market-entry dates, and harm confidence in developer as lingering projects result in doubts of their reality.

- Implement an educational program designed to inform and educate newly appointed zoning and planning board members to the development business, zoning ordinances, development regulations, and local approval process. It would also be beneficial for board members to learn how to read and understand blueprints. They should also learn standard land-development practices in their community. An informed board member will be a contributor to the process; they become constructive debaters of issues, which in return may be concluded efficiently and effectively at the board meeting.

**Scheduling Methods**

Scheduling project planning, permitting, and construction activities will continue to evolve in software-driven methodologies. User-friendly computer methods will be more widely used than complex scheduling programs. The land-development industry
bases its projected schedule on an estimated closing date for a property or house sale to meet corporate closing goals. The schedule is then projected backward to a date on which the design team members should be authorized to start their work product. In active markets, the design team must compress their production schedule to compensate for the regulatory-review time and for unforeseen design or political complications.

As an example, to build and close a house, use six months for construction; to construct the infrastructure for the first closing, use six months. Use twelve months for regulatory approvals and six months for design planning. And factor in four months for land negotiations and due diligence. Without special circumstances or project complexities, a master developer would need to start looking for land at least three years in advance of the first closing expected to occur in the project. And this illustration is ambitious. Obviously, a pro development regulatory environment could expedite the approval process.

The developer needs to assess the time required by each design team member to complete their work. In many cases, the master developer attempts to expedite the design-planning component when the creative aspects should not be accelerated. Large-scale projects require vision and brainstorming. This creative effort should not be constrained or managed by certain dates. Most agencies have defined submission dates each month and impose specific timetables in which to process and review an application. In jurisdictions with specific dates for submissions, the master developer must use these dates as the start of the regulatory review and approval process. The land-use plan or design documents should use submission-date requirement as the completion date for their work product.

As an example, a zoning board may meet only on the third Tuesday of each month. To be considered for the meeting that month, the application and plans must be submitted twenty days prior to the meeting date. If this is not accomplished, the application may be delayed until the subsequent month. Or in many municipalities, the delay at the zoning or planning board level can be several months. Thus, it is essential for the land-use plan or construction-drawing process to be actively managed by the master developer.

There are many components to the preparation of the land-use plan, and it only takes one unresolved issue to delay the finalization of the plan. Preparing a land-use plan is a balance between creative, technical, political, and financial points of view. All of which may have issues directly affecting the progress of the project. The master developer needs to actively manage the design team members in preparing the land-use plan in a timely manner. The regulatory process will be initiated by an application before sales, construction, and closing can be contemplated and scheduled more definitively.

Until a submission is made, the master developer must work with each design team member to determine the time necessary to complete his or her work. The project critical path for project planning is not always consistent from one project to another. In fact, many issues may not be resolved until action is taken by the zoning or planning board on the application. The master developer should understand the
political dynamics associated with development projects in the municipality. Before the large-scale master plan has been submitted for regulatory review, the master developers may seek to streamline the regulatory-review process by:

- Recommending to government officials that they review the plan distribution and routing system for their agency. The planning department typically is the lead department charged in accepting applications and routing the plans to other departments and agencies. Local government can streamline the review process by having each department process the plans in a similar fashion and standardizing the review forms by using a standard number routing system.

- Recommending to government officials that the project review status and comments should be entered into a Internet-based review-status system accessible to everyone. This would allow the applicant and their design team members access to review comments and to understand the current status of the project at all levels of government. The government contact list is also important in discussing issues relative to comment interpretations.

**Review and Approval Process**

The regulatory review and approval process can very rarely be influenced and should not be compromised by government for any project that impacts the citizenry, as does a large-scale project. The approval process provides a forum for citizens to present their views in a constructive forum. A successful project utilizes experienced design team members who understand the market, location, and political environment. To expedite the approval process, the master developer may request government to:

- Limit the number of public hearings if the master developer has scheduled neighborhood meetings with adjacent property owners.

- Recommend the town institute an informal hearing format with the board members and the general public to discuss the overall design concepts, land uses, and benefits of the project. This will allow all parties concerned to voice their opinions in a nonbinding forum. This informal review highlights the major factors impacting the large-scale project. It provides a forum in which the developer may better understand the political hot buttons. As a result the master developer has the opportunity to build upon the positive input and address any concerns prior to making a formal application to the board.

Time is money. In a strong market, regulatory boards and staff are typically overwhelmed with project submissions. This will tend to slow the process down. There are measures local government may enact to ensure timely reviews. For example:

- If the town only has one board hearing per month, request additional board meetings be scheduled to process a backlog of applications
If the town has several board hearings per month but a backlog still exists, the master developer should request a special hearing. In many instances, local government will schedule a special hearing date with a payment of an additional fee. The hearing will be set aside only for that application.

The regulatory agency should have mandatory review time in which applications must be acted upon.

To ensure the system is structured to expedite applications, the town could implement an expediter position responsible for managing applications through the governmental maze of agency reviews and approvals. The expediter is a nonbiased position retained to streamline the process and eliminate regulatory-system roadblocks.

Many communities approve a land-use plan for a large-scale project after public hearings, neighborhood meetings, technical reviews, and outside agency reviews are completed and all of the issues are resolved to the satisfaction of the applicant and government-approving body. To further expedite the review and approval process, the master developer may provide additional recommendations, including the following:

Once the land-use plan has been approved as the basis for development, a master developer may recommend to local government that the land is vested by right. A developer must only comply with the ordinance or specifics of the approval, which may include separate standards for a large-scale project. If this is the case, the master developer could proceed with construction drawings and submit these plans directly to the regulatory staff for review and approval. This would permit the design professionals to resolve technical issues outside the circle of political influence.

Establish a system in which the developer and government review staff can efficiently resolve technical issues or compliance issues. To achieve this goal, local government should implement an arbitration system that would include using a third-party professional to resolve or mediate any differences of opinions. Typically this would be isolated to technical criteria or infrastructure-design approaches. Resolving these types of issues would ensure the review process does not get mired down in technical conflicts.

Large-scale projects master planned to complement the land form and land characteristics while incorporating land-uses benefiting the community as a whole should be embraced by government. Properly designed land-use plans and project-construction documents can be expedited through the government review and approval process to encourage large-scale developments. Financial commitments and risks are enormous for anyone seeking to obtain a large-scale land-use plan approval. Encouraging master-plan approaches for large undeveloped land areas should be the goal of any growing community. Public and private interests can be protected through an efficient and effective review and approval process. Thus an expedited government review and approval process will save time and effort to the mutual benefit of the developer and the community.
9.12 Homeowner and Community Associations

Creating a large-scale project maintaining architectural and aesthetic integrity requires a meaningful effort to create organizations charged with the responsibility of managing the appearance of the community. Typically, the master developer will create an umbrella community association that manages the entire community, common-area improvements, and open-space areas. The nonresidential areas would also be included in the community association. The building architecture, colors, signage, and landscaping elements would require management approval.

Common-area improvements managed by the community association will vary based on the project design and vision. Common-area improvements may consist of community buildings, recreation facilities, roadways, drainage facilities, storm-water management facilities, open-space areas, and tracts of land used by the community. The street-lighting electrical costs may also be included in the community association monthly budget. The umbrella organization is the initial control group organized by the developer. The developer generally retains control of this organization throughout the build-out of the project so that the inherent values of the project are protected and enhanced. The community association would provide management services, maintenance services (including lawn mowing, snow removal, etc.), and building or site maintenance for all common-area facilities. The level of maintenance will directly affect the association budget and monthly payments required of each member.

Many states require the registration of the community or homeowner association documents with a state agency and those documents made public for review by potential buyers. It is becoming more common for local approving agencies to require that community or homeowner association documents be approved by the state prior to issuing the final land-use approval. Public knowledge of how the project will be managed, maintained, and administered is important to the overall integrity of the project.

If the master developer sells a tract of land to another builder or developer, that tract of land would have its own homeowners association. The master developer would require oversight approval of the documents to ensure consistency with the overall community vision and architectural control. In most large-scale projects with common-area improvements, each member would have two monthly fees. For homeowner and community associations, monthly-fee assessments need to be analyzed and evaluated by the master developer at the inception of the project-design program. The total association fee assessed to each housing unit must be reviewed and approved by the master developer to ensure the monthly fee is manageable and market sensitive.

9.13 Summary

There are a multitude of challenges in designing, approving, and constructing a large-scale project. Most of the tangible ideas of a project can be quantified by cost. The decision to proceed with those ideas may be a result of a cash-flow
analysis supported by marketing data. Large-scale projects, if evaluated only on a cost basis, will always be financially successful. Simply because a master developer will adjust the residential densities to attain more units or expand the intensity of nonresidential uses or reduce the community amenity or common-area improvement program to reduce costs or spread costs over more uses. However, master developers very rarely have the ability to achieve the highest and best use for a property because of government regulations and politics. Successful and profitable large-scale projects must be financially managed but must achieve political support and attain government willingness to approve a cost-effective plan in a timely manner. Managing the regulatory process by obtaining permits and approvals in the shortest possible time is more important than many of the tangible ideas created to market the project. Achieving the proper balance between all entities is a key to successfully developing large-scale projects.

DISCUSSION TOPICS

1. Describe a regulatory process established to resolve conflicting regulations or design criteria between agencies.
2. Outline the pros and cons for at least three (3) scheduling methods best suited to track the tasks needed in designing and permitting a large-scale project.
3. What should the role of the federal government be in reviewing and approving local land-development projects?
4. Should property values be protected by guidelines, rules, and regulations administered by residents involved in a community association? And how specific should the controls be?
Chapter 10

Project Master Schedule

10.1 Introduction

Developers of large-scale projects need a lengthy and detailed master schedule for preparing the overall land-use plan, initial infrastructure design, and common-area-amenity site plans. There are numerous scheduling methods and software packages on the market and more will be developed for the real estate industry. Select a methodology that is user-friendly, enabling revisions of the schedule as needed. It is typical for large-scale projects to have complex technical issues as well as nuanced political issues. To resolve or conclude matters of a complex and political nature takes time and effort. The schedule method selected should allow the retention of the original milestones while it allows alterations to the due dates as necessary.

In many instances, the design team will schedule activities based on dates certain to dictate production time. This is in contrast to creating a schedule based on completion timeframes for each specific task. In most cases, local jurisdictions will annually establish a meeting schedule for the zoning board, planning board, and town council. This schedule establishes the exact dates on which each board will meet to hear applications. Government will also establish dates on which land use or design plans must be submitted for review prior to a scheduled board hearing. Developers have a tendency to rush the submittal package since time is of the essence. However, a properly structured master plan, addressing political, staff, and general public concerns, should be well received by regulatory and political officials.

For a large-scale project, the master developer may have to contact multiple landowners to amass sufficient adjoining land for the project. Developers strive to concentrate their land acquisition efforts in a geographical location having market appeal. In many instances, the landowners have not listed their property for sale and may not have even considered selling their land. In these instances, the master developer must sell the project vision to the property owners. There isn’t a set
time table for negotiations and contract processing but the developer must strive to expedite the process.

By combining properties design flexibility may provide different access points, transportation links, marketing windows, and utility connections. The master developer would approach each landowner in confidence and attempt to control all of the properties essentially at the same time. After some of the properties are under contract, adjacent landowners may consider selling as well. Developers should always evaluate adjacent properties for development potential to expand the current project limits. Not only is this approach viable for master planning, but it allows future continuity in the operations and management of the project. Also, the end users, builders, and developers will see the long-range benefit of centralizing sales, management, and operations. The contract process will take time, effort, and negotiation skills necessary to address concerns of the landowners. Once the properties are under contract, the master developer will have negotiated a due-diligence period in which the site assessment will be initiated and concluded. The timeline for the project design, permitting, and construction phases will be forecast from the date in which the master developer proceeds with the conditions of the contract.

### 10.2 Site Analysis

The initial site-analysis work should be completed during the due-diligence period of the land-purchase contract. This period will vary from seller to seller and from one marketplace to another. The buyer should seek a time period sufficient in length to assess the constraints of the site, order the title work, and initiate phase one environmental studies. This initial site-analysis period may range between 90 to 180 days. In “hot” markets, landowners are not agreeing to lengthy due-diligence periods. In many cases, the land is sold “as is” and for cash.

After the due-diligence period, the master developer has a “go or no go” decision milestone outlined in the contract. If the developer proceeds, the land purchase agreement should include the next contract benchmark. This go-or-no-go decision milestone allows the developer to proceed or terminate the contract, if structured correctly, without penalty. During this period, the boundary survey, topographic survey, utility locations, wetland delineation, and more extensive soils testing could be initiated to create the base map used for the overall land-use plan. This level of service and the length of time to complete the base map are directly related to the size of the property, how many separate parcels, configuration of the parcels, complexity of site topography, wetlands, floodplains, existing vegetation, and existing infrastructure—all of which were analyzed to some degree during the due-diligence period. Expediting the schedule during the due-diligence and base map—preparation periods will necessitate soft-cost expenditures for surveying, environmental, and engineering services. Depending on the complexities of the site, the surveying and environmental analysis may take from 30 to 90 days. The engineering assessment of the technical issues affecting the project could be addressed concurrently with the field work.
If the master developer has another go-or-no-go decision point and decides not to proceed with the project, the soft costs for the design professionals would be “left on the table,” unless these fees were negotiated with the seller. After all, the services rendered are site specific and could be used by the landowner in marketing the property to another buyer. Design professionals would need the appropriate releases for distribution of their work product. As an example, a decision factor in the contract could be contingent upon obtaining a number of lots, obtaining land-use-plan approval by local government, receiving reservation of water and sewer availability, or simply more time to assess the market and potential of the project.

10.3 Market Study

The market area should be studied for residential and nonresidential development opportunities prior to negotiating land contracts. Smaller projects may proceed without a market study, but large-scale projects with build-out estimates extending for many years need a market basis on which to proceed. In many locations, the land best suited for development has been purchased and/or developed. In some cases, there may be land “off the market” but conducive to development. This land is best suited to a contract agreement before it becomes publicly available. If, however, the land becomes available for purchase, developers must act on the land opportunity first and proceed with the market study during the due-diligence period. This scenario, although not ideal, can work. But the developer needs to have the market research retained to complete the study simultaneously with the due-diligence period.

With the base map and market study, the developer would be able to schedule the initial concept meetings with the selected design team members and have a fruitful meeting. Depending on the complexities of the site, the developer may limit the initial concept meetings to those design team members contributing ideas relevant to the development program. The market study establishes the framework on which the land-use plan is created and materialized to meet market considerations. From this basic information, the developer would start the land-use planning process. The market study may take between 45 to 90 days, depending on the characteristics of the local market. The market study is distributed to design team members. They should have sufficient time to digest all of the facts and figures. This study should be completed prior to the completion of the base map. This would allow the developer and design team members to discuss concepts, land uses, and other market considerations that adhere to the specifics of the market study. The developer has an opportunity to expand the market study for a more in-depth analysis of a specific market segment. This expanded approach may include conducting focus group sessions. The developer must have specific questions and ideas for the focus group to consider. Although this may be time consuming, the results will further identify the market depth, preferences, and absorption rates. This approach is a risk reducer. Expanding the market study for a more in-depth analysis may add 45 to 60 days.
10.4 Marketing Program

The marketing program may be initiated at anytime during the land-use-plan preparation (see Fig. 10.1). The developer will also establish the marketing budget. The developer should entertain proposals from several local and regional marketing firms. Typically, however, the developer will initiate the marketing program in two parts. The marketing specialist will initially create a project image and sense of identity. This would include selecting land-use area names, street names, and color schemes for the community; amenity packages; and nonresidential themes. Logos, tag lines, and branding opportunities would also be prepared and evaluated as the project progresses. Community brochures, photography, and supporting literature would be prepared to reinforce the land-use-planning concept. It would be beneficial to have the marketing approach created concurrently with the preparation of the land-use plan. This would bring the core design team members together for conceptualizing and brainstorming project design and identifying market opportunities.

Figure 10.1 Marketing Opportunities. The build-out period of a large-scale project will span over many years. Prepare a marketing and advertising plan to sell the community vision and concept.
The next phase of the marketing program is to prepare a comprehensive marketing plan for the project (see Fig. 10.2). For large-scale projects, marketing firms would consider various strategies, for example:

- Direct mail campaigns
- Billboards along the major transportation links
- Radio or television spot ads
- Newspaper ads
- Press releases
- Mailing lists of previous buyers
- Scheduled special events
- Open houses
- Networking events
10.5 Public Relations Program

Large-scale projects will have a significant impact on the existing community. The impact typically will be due to increased traffic volumes, school-age children, and overextension of public services. Based on the impact, the developer may consider retaining the services of a public relations firm. This firm should be retained as the land-use plan is being prepared. This design team member must fully understand the local impact in terms of number of residential units, nonresidential uses, and other components of the design. The public relations firm should be proactive in the dissemination of information and facts about the project. In many cases, the general public thinks they understand the various aspects of the project, but they are not cognizant of the truth of the project. The public relations (PR) firm would establish an information-flow continuum as the project is designed and reviewed by governmental agencies.

The information flow is important for the community to understand the project specifics and appreciate the positive aspects of the project. The PR firm would also dispel any rumors about the project. As the land-use plan or construction drawings are being processed by the various agencies, the PR firm should expand their plan to include information dissemination about the master developer; listing principals, past successful projects, community involvement, and expertise in developing large-scale projects. The PR firm should also provide media training to the master developer’s team and to selected design professionals. A company spokesperson needs to be selected for responding to inquiries from the media, general public, and government officials. The company representative should also be skilled and trained in answering questions and making public presentations.

10.6 Design Team Members

Retaining the services of design team members will be a continuous effort by the master developer. Many developers will evaluate and select firms based on many factors:

<table>
<thead>
<tr>
<th>Timing</th>
<th>Their ability to meet project schedules and have the ability to assign sufficient staff expertise.</th>
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</thead>
<tbody>
<tr>
<td>Experience</td>
<td>Their professional experience on preparing large-scale projects and land use plans. Their understanding of the overall community and regulatory issues affecting or impacting the viability of the project.</td>
</tr>
<tr>
<td>Knowledge</td>
<td>Their knowledge and understanding of ordinances, regulations, and standards for large-scale projects. Knowledge of review staff influences and community hot buttons.</td>
</tr>
</tbody>
</table>
Cooperation  Their accessibility and willingness to work with the design team and to look out for the best interest of the developer and project concepts.

Contacts  Their local political knowledge, strong regulatory staff relationships, and reputable industry associations.

Fee  Each consultant will base their fee on the scope of services outlined by the master developer. In most cases, the consultants will either work on a lump-sum or hourly contract basis. However, the master developer needs to be very specific in defining the work tasks for each discipline. If the consultants have an excellent understanding of the tasks needed, they would be more willing to enter into a lump-sum agreement. Master developers need to define each consultant role and know their costs.

Retaining the services of consultants for design development of a large-scale project requires understanding of the scope of work necessary to complete the project for regulatory review and approval. Each project, large or small, will have its own unique design requirements. The scope of services of each design team member should be assessed comprehensively at the outset of the project. To assist in determining the tasks assigned to each design team member, use the following categories:

1. Due-Diligence Period
2. Land-Use Planning
3. Infrastructure-Construction Documents and Regulatory Permitting
4. Infrastructure Construction
5. Post-Infrastructure Construction (turnover and unit construction)

Surveyor

1. Due-Diligence Period
   - Boundary survey
   - Topographic survey
   - Wetlands survey
2. Land-Use Planning
   - Tree surveys
   - Surveys for off-site improvements
   - Land-title surveys (alta)
   - Rights-of-way surveys
3. Infrastructure-Construction Documents and Regulatory Permitting
   - Final plats
   - Legal descriptions

4. Infrastructure Construction
   - Condominium exhibits
   - Land-development construction stakeout
     - Clearing limits
     - Access points and erosion-control measures
     - Earthwork staking
   - Storm-drainage structures and pipes
   - Water-line staking, including fire hydrants, connections, valves, etc.
   - Sewer-line staking, including manhole locations, and connections
   - Utility line crossing locations: electric and telephone
   - Curb staking
   - Driveway curb cuts
   - Monuments

5. Post-Infrastructure Construction (turnover and unit construction)
   - Lot- and housing-stakeout services
   - Building location surveys
   - As-built surveys for infrastructure
   - Final plot plan for house

Environmental Consultant

1. Due-Diligence Period
   - Phase I Environmental Study
   - Phase II Environmental Study
   - Wetlands delineations: absence or presence

2. Land-Use Planning
   - Endangered species studies
   - Cultural or historical research
   - Liaison with government agencies

3. Infrastructure-Construction Documents and Regulatory Permitting
   - Environmental permitting
   - Jurisdictional-stream analysis
Prepare wetland and stream-mitigation plans

4. Infrastructure Construction
   Construction monitoring

**Soils Testing Firm**

1. Due-Diligence Period
   Initial due-diligence soils research
   Site-investigation borings or test pits

2. Land-Use Planning
   Extensive soil analysis for unsuitable material

3. Infrastructure-Construction Documents and Regulatory Permitting
   Permeability testing for basins
   Pavement design services

4. Infrastructure Construction
   Earthwork monitoring, field services
   Soils testing during land-development construction
   Materials testing services

5. Post-Infrastructure Construction (turnover and unit construction)
   Compaction tests for housing pads

**Attorney**

1. Due-Diligence Period
   Vacant land purchase agreement

2. Land-Use Planning
   Political and surrounding-property liaison
   Master developer’s legal representation before zoning board
   Prepare community or homeowner association documents

3. Infrastructure-Construction Documents and Regulatory Permitting
   Resolution compliance management
   Negotiate and prepare developer’s agreement
   Purchase agreements for easements and rights-of-way
   Prepare deed restrictions or covenant and restrictions

4. Post-Infrastructure Construction (turnover and unit construction)
   Prepare agreements to convey land-use parcels
1. Due-Diligence Period
   Review market study with master developer
   Site-analysis and lot-yield studies

2. Land-Use Planning
   Prepare project-design program
   Greenways, trails, and pedestrian connectivity studies
   Prepare land-use plans
   Develop design criteria for land-use parcels
   Present the land-use plan at zoning board hearing
   Liaison with regulatory staff
   Present project concepts at neighborhood meetings
   Prepare streetscape plans
   Government agency coordination
   Presentation graphics

3. Infrastructure-Construction Documents and Regulatory Permitting
   Prepare site plans for common area amenities

Civil Engineer

1. Due-Diligence Period
   Site-investigation and site-analysis services
   Contact various government agencies for standards and criteria

2. Land-Use Planning
   Participate in project-design program with other design team members
   Review land-use studies for technical compliance
   Prepare conceptual water and sewer designs
   Prepare conceptual grading plans for preliminary earthwork quantities
   Floodplain analysis
   Review common-area infrastructure layouts for compliance

3. Infrastructure-Construction Documents and Regulatory Permitting
   Provide value-engineering services
   Prepare communitywide storm-water management facility plans
   Develop a best management practices report for the project
   Prepare preliminary and final construction documents for infrastructure
Clearing plan
Grading plan
Road plans and profiles
Water-line design
Sewer-line design
Drainage design
Storm-water management facility design
Best management practices design
Off-site road or utility line–improvement design
Submit applications for government permits and approvals
Present project plans to zoning and planning boards
Review agency liaison for obtaining permits and approvals
Provide technical-support documentation for developers agreements
Interface with electric, telephone, gas, and cable companies
Prepare conceptual land-development-cost estimates

4. Infrastructure Construction
   Provide construction-management services
   Provide project-administration services
   Provide construction-observation or -inspection services

5. Post-Infrastructure Construction (turnover and unit construction)
   Certify to as-built surveys

Financial Partner

1. Due-Diligence Period through 5 (meaning that the financial partner is involved from due diligence through post infrastructure construction— they provide); Post-Infrastructure Construction
   Provide financial resources for soft costs
   Provide project cash-flow analysis
   Provide performance bonds
   Construction financing

Marketing Specialists

1. Due-Diligence Period
   Prepare market-research report
   Prepare marketing program and budget
2. Land-Use Planning
   Prepare brochures, media kits, and master developer history
   Create project name, land-use-area names, and road names

3. Land-Use Planning through 5 (meaning that the Marketing specialists provide supporting documents during the entire process from due diligence through post infrastructure construction); Post-Infrastructure Construction
   Provide supporting documents to appropriate design team members

4. Infrastructure-Construction Documents and Regulatory Permitting
   Review model center design

**Architect**

1. Due-Diligence Period
   Initial design team member to develop project-design program

2. Land-Use Planning
   Prepare conceptual architectural renderings for presentation
   Review land-use plan
   Appear at zoning- and planning-board hearings
   Prepare architectural style, theme, and material usage program

3. Infrastructure-Construction Documents and Regulatory Permitting
   Prepare construction documents for common-area amenities
   Prepare construction documents for recreational buildings
   Provide interior design services for common-area buildings

5. Post-Infrastructure Construction (turnover and unit construction)
   Enforce community association architectural guidelines

**Landscape Architect**

1. Due-Diligence Period
   Site investigation for quality of vegetation and tree-save areas
   Assess project-road frontage as marketing window

2. Land-Use Planning
   Review land-use plan
   Appear at zoning- and planning-board hearings
   Prepare softscape-design program
   Prepare hardscape-design program
3. Infrastructure-Construction Documents and Regulatory Permitting
   Design entrance features, landscaping, and community monumentation.
   Design common-area landscaping and planting plans
   Prepare community-signage designs
   Design wetland-planting plans for best management practices
   Design site-lighting plans for common areas and amenity sites
   Design irrigation systems
4. Infrastructure Construction
   Provide construction-management services

**Economist**

2. Land-Use Planning
   Prepare project tax-benefit analysis for community
   Prepare community and homeowner association fee structure
   Analyze property-value assessments
   Prepare community impact reports for schools and public services

**Traffic Engineer**

2. Land-Use Planning
   Review land-use plans for off-site road-improvement requirements
   Prepare traffic-impact studies for surrounding roads
   Classify project roadways based on traffic counts
   Present traffic-impact report at zoning- and planning-board hearings
3. Infrastructure-Construction Documents and Regulatory Permitting
   Review engineering plans for circulation and turning movements
   Review parking-lot designs

**Water and Wastewater Consultant**

1. Due-Diligence Period
   Liaison with water and sewer agencies
   Assess the availability and serviceability of existing water and sewer
2. Land-Use Planning
   Prepare overall water-design plan to insure ample supply and pressure
   Prepare alternative sewer-connection designs for cost and approval
Chapter 10 Project Master Schedule

3. Infrastructure-Construction Documents and Regulatory Permitting
   Assist in developer’s agreement on water- and sewer-connection fees

Real Estate Firm

2. Land-Use Planning through 5. Post-Infrastructure Construction (turnover and unit construction)
   Broker of record for selling land-use pods
   Leasing agent for nonresidential uses

10.7 Base-Map Preparation

The base map is prepared by the surveying, environmental, and engineering design team members. This may take from 60 to 120 days, depending on the size of the project. During this time the title will be researched for boundary problems with the property in question. It is not uncommon to discover boundary problems and rights-of-way, easements, and encroachments that may impact the development potential of the site. This condition may also cause a delay in the project while the issues are resolved. Floodplains, wetland areas, and other environmental constraints need to be identified and shown on the base map. The developer should have the environmental mapping completed prior to initiating the field-surveying work. Soil-testing work may run concurrently with the surveying services. It is prudent for the master developer to select the areas for testing. The surveyor will stake the soil-testing site in the field and have the information transposed to the base map.

10.8 Land-Use Plan

Once the base map has been completed, this plan is provided to the design team members for review. Another site inspection should be scheduled with the design team. This site inspection is important to relate the physical characteristics of the site and surrounding areas to the base-map document. The design team should take plenty of photographs to record the site characteristics for ease of reference during the land-use planning phase. The land-use-planning process is a dynamic and fluid conceptualization of the information provided by the various disciplines and the characteristics of the property. A multitude of planning variations of the site should be prepared for discussion purposes. The developer should take a leadership role in orchestrating the meetings and focusing on project schedules and construction costs.

Brainstorming, idealizing, and conceptualizing are not controlled by time but by creativity and energy among the design team members. However, the developer must keep the process moving forward. It is not uncommon for ideas and concepts to linger for decisions and reactions due to “out of the box” thinking. It is critical for the developer to expedite this process so that reasonable conclusions can be reached
Figure 10.3 Land-Use Plan Schedule. The initial land-use plan alternative should be prepared during the due-diligence period. Budgets should be prepared and cash-flow requirements analyzed before a go-no-go decision is required by contract.

within the shortest period of time. At the very least, the initial iteration of the land-use plan should be prepared before the due-diligence period has expired (see Fig. 10.3). This allows the developer to assess costs, advantages, and disadvantages of the project before a go-or-no-go decision is required by contract. The master developer acts as an expediter, managing ideas to reach a consensus plan.

In some instances, the developer may seek political and staff comment on the land-use plan before moving forward with hard design. The concept plan may also be presented to adjacent and neighborhood groups, as it is being developed. This will provide insight on problem areas or attain positive feedback, which can be reinforced in the plan. This input is solicited based on a concept plan rather than a firm land-use design. The purpose is to build a consensus and create alliances for a collectively designed project. The input will provide the design team with a list of critical community hot buttons. These issues need to be addressed in the plan.
and outlined at the public forum. It is not uncommon for politicians, the general public, and regulatory staff to request developer solutions to existing problems. Even with legal representation, the master developer should consider these issues on their own merit and measure the good will versus the costs. The dynamics of preparing a land-use plan that is marketable, sustains development, attains regulatory acceptance, and is profitable is an art. The developer must also manage the schedule. But the process is truly an orchestration of thoughts, ideas, and personalities constrained not by time but creativity. A consensus plan should reflect a vision, balance the constraints, and be cost effective and embraced by all.

10.9 Model and Sales Center Design Program

A business plan for sales and marketing of land-use pods should be developed in conjunction with the preparation of the land-use plan (see Fig. 10.4). The developer should consider the best way in which to market the project to builder-developers.
specifically interested in land uses reflecting their expertise. Also, once there is serious
interest in the project, the master developer needs to consider how each individual
project will be marketed. There are two viable options with variations of each, but the
concept remains valid:

a. Construct a community building for selling and marketing the entire project
and the individual land uses. As each land-use pod is sold, the buyer
(builder-developer) would be allocated a sales area within the community
building for marketing and selling purposes. This would also include space set
aside for leasing operations of rental units, office space, or retail commercial.
The purpose is to generate traffic and activity in a central location. Thus,
buyers of land-use pods or an individual house would only need to visit a
central location within the community. This approach would assist the
purchaser of a land-use pod from having to construct a satellite sales office at
their individual project site. Or,

b. The master developer may select a sales center designed to market only the
land-use areas and also act as a visitor center for the entire community. This
approach would require each builder-developer to construct a sales model
area or to lease office space for each separate project within the large-scale
community. This is an added expense, but it allows each project to control its
buyers. The phasing of the project is also critical for serving the needs of each
land-use pod. Also, builder-developers may want to provide a temporary sales
trailer until the permanent sales office has been completed. The sales trailer
should be designed and constructed consistently with the overall aesthetic
appearance of the project.

A decision on which concept to use should be made at the start of project.
Thus the land-use planning may incorporate the necessary infrastructure, marketing
window, and community-identity designs consistent with the proposed sales- and
model-area approach. Once the decision has been made and the land-use-planning
process has progressed, the master developer should assess the timing of the approval
process and determine the need to start architectural working drawings for the central
community building.

The timing of this expenditure should coincide with the land-use-plan approval
and any approvals granted permitting construction to commence. The architectural
plans would be prepared in concert with the phase one engineering design. The
architectural firm retained for these services could also provide the interior design
services. The engineer would prepare the site plan for the community-amenity project,
including parking, access, lighting, landscaping, and infrastructure design.

10.10 Entry and Community Features

Many master developers will budget for and construct the primary entrance feature for
identity. The physical construction also visualizes commitment. The name, logo, and
other identity features should be finalized before initiating the entry feature design. The entrance feature should complement the overall community-marketing theme, including material and color selections. The entrance feature may be a combination of features such as: body of water, pedestrian pathways, signage, entry feature, hardscape, lighting, irrigation, and landscape material. The entrance road will also be designed to highlight a sense of arrival to the community. Typically, this is accomplished by a change in pavement surface texture or color but can also be achieved with a formal median design with landscaping and monumentation.

The cost of the entry feature should be estimated on a concept design for cash-flow purposes. Other community features located throughout the project would use the entrance feature design program as the design pattern. The primary entrance feature budget will vary considerably due to the length of frontage road and total land-use area. The total cost of community features will be distributed proportionately to each land-use pod. Balancing cost versus marketability and profitability is determined for each specific project and by each developer. Rule of thumb budgeting and past experiences by the developer or design team members should be sufficient in preparing a starting-point budget. This budget would be continuously modified as the design and project progresses.

10.11 Infrastructure Design and Construction Phasing

Even in a hot market, the master developer should approach a large-scale project with phased construction. This approach would limit up-front cash-flow requirements while maximizing available land-use pods for sale. This is achieved by altering the land-use plan consistent with phasing. Providing alternative land uses in the first phase of construction would also provide an optimum balance between revenue producing options while minimizing the cost associated with infrastructure construction to each pod. The engineering design firm should review the viability of the land-use plan and how the plan will function with a phasing program.

There are many elements of infrastructure design to be considered by the engineer for cost effective and functional design. It is very important for the engineering firm to evaluate the land-use plan as it is being developed by the design team. The engineer will balance the creative approach with practical and regulatory points of view. They will also ensure the phasing plan, site characteristics, and utility-line extensions provide a workable solution. Many construction problems and cost issues may be avoided with a well-coordinated, dynamic design team assessing all of the technical aspects of the property. If possible, minimize sewer- and water-line extensions through future phases to serve the first phase. Require the engineer to provide value engineering on site grading to limit import or export of material in the first phase. However, it is beneficial to have excess material than to generate material for the first phase construction. Also, purchasing fill material should be minimized or eliminated. The suitability of the soil in the first phase should be analyzed for suitability for first-phase uses and construction.
Phase one design should also consider traffic circulation to separate construction activities and trades from purchasers. Storm-water management and best management practices design programs should be centralized to minimize numerous separate facilities requiring separate permitting, operations, and maintenance responsibilities. Off-site road or intersection improvements should be delayed until after the first phase is constructed, if possible. This would assist in managing cash-flow requirements. The phasing program should include platting land-use pods for property transfer as soon as practical from a regulatory viewpoint.

Obviously, selling entitled property is the goal of the master developer, but it should ideally be sold at the rate at which the project will be constructed. Absorption of the entitled property created by the land-use plan will require infrastructure design and construction activities to mirror the sales pace. In many instances, the pace of development may be dictated by the availability of water and sewer facilities. The engineer should use the due-diligence water and sewer reports to maximize the number of residential units and nonresidential uses that can be served by the existing facilities. Postponing construction of expanded or altered existing facilities is beneficial from a cash-flow position; but a sales pace can change more rapidly than the construction process. Thus the developer may choose to proceed with certain infrastructure improvements months before an anticipated sales release of a phase.

10.12 Summary

The most important milestone in the preparation of the land-use plan is the date by which plans must be submitted to government to be placed on the next board agenda. The process before this specific date is managed by the master developer. Once the land-use plan has been submitted, government will have a specified review period as dictated by ordinance. However, large-scale projects tend to create their own regulatory-review schedule. Also, developers may have minimal influence to expedite the review and public scrutiny process. The design team is under the influence of the developer and should meet their schedules. Depending on the location, growth or no-growth politics, and the ability of local government to handle large-scale projects, will have a direct affect on the timing in which the application is heard by a zoning board. It is conceivable that a land-use plan could be approved within 4 to 6 months, but in some cases it will take years to obtain approval. Stay on schedule and within budget. The performance of the design team professionals will directly affect the project schedule and the development costs.

Master developers must not be dictatorial and stifle creativity but must balance the creativeness with practicalities of time and money. Each professional must adhere to a schedule so the overall project is not hindered by the delay of one important component. The development of a large-scale project is a methodically planned pattern of growth over a long time. A project well planned and conceptualized will increase property values. Thus, it is important to attain entitlement approvals in a timely manner. Manage construction at an acceptable pace for cash flow, sales, and closing purposes. Time is money. Expediting the design and entitlement stages of the
project is important to the overall profitability of the project. Resolve issues without delay. There are no assurances that, if you build it, they will come. Thus, time and timing are important. Obtaining entitlements in a timely manner reduces the risk of development. Stay on schedule and within budget.

Estimated timeframes for specific tasks are outlined as a guide. Many factors influence the timeline. However, the developer must schedule each task with the design team member.

**Site Analysis**

Day 0 to Day 180 Site Analysis, during due-diligence period  
Day 30 to Day 90 Survey and Environmental Analysis

**Market Study**

Day 45 to Day 180 Market Study  
Day 120 to Day 180 Expanded Market Study

**Marketing Program**

Day 180 to ongoing Marketing Plan

**Public Relations Program**

Day 180 to ongoing Public Relations Firm

**Base-Map Preparation**

Day 180 to Day 240 Site-analysis conclusion illustrated on the topography and boundary survey

**Land-Use Plan**

Day 240 to Day 370 Prepare alternative land-use plans for internal review and submission of final plan to government; land planner

NOTE: The final land-use plan would be submitted to local government upon completion by the design team. The developer should also initiate the design drawings for the model center, entry features and phase one infrastructure once the land-use plan has been submitted. The risk of regulatory changes may exist, but working with government will minimize the risk. Also, accelerating the construction drawings outweighs the risk of changes.
**Model- and Sales-Center Design Program**

Day 290 to Day 370  Design site plan within phase one of the project—design team

NOTE: The community-amenity site may also be incorporated in phase one. The site plan and construction documents would also be initiated at this time.

**Entry Feature Design**

Day 290 to Day 370  Primary Entry Feature, designed by the landscape architect

**Infrastructure Design and Construction Phasing**

Day 0 to End of Project  Civil Engineer preparing design concepts, construction drawings, and certifying to construction

**DISCUSSION TOPICS**

1. What is the most important date of the project schedule for a master developer? Why?
2. In a no-growth or slow-growth jurisdiction, what are some of the ways in which the master developer can expedite the regulatory-review process and shorten the approval schedule?
3. What are the disadvantages of a project that exceeds sales expectations?
4. Which design professional is most important in the overall financial success of a large-scale project? Why? What characteristic of the firm is most important in selecting the right firm for the project?
11.1 Introduction

The public has a significant and important role in the land-development industry. The public’s voice may be heard in debate at planning and zoning board hearings on any land-development application. In the majority of applications, most citizens attending an evening government meeting to hear a project presentation are objectors. The land-development industry must change its approach toward the public to have more of an open dialogue with the citizenry. The general public has the opportunity to present their objections, which may affect the profitability of that project. Even in the case of a project with zoning vested by right, the developer should engage in discussions with neighbors or neighborhood groups. The general public has the right to put their opinion on the public record and enter into constructive debate with the developer. The forum in which this takes place can be one-on-one with the developer or in a public forum, at a zoning board hearing. In either instance, the public has the political influence to affect the project outcome. In many cases, developers recognize the power of the general public and initiate community-relations programs during the base-map-preparation phase.

The overall design approach of large-scale projects, although having wider exposure to the general public, is generally well received because of its vision, overall concepts, and architectural appeal. The comprehensive-planning approach satisfies the community’s goal for diversified housing options and provides economic tax benefits from nonresidential uses. Developers of large-scale projects have a distinct ability to promote well-conceptualized projects through proper utilization of land.

Disjointed development patterns result in community sprawl. Large-scale projects may be an all-win opportunity. The needs of the community may be addressed by
the master developer only if the project size, land-use diversification, and regulatory concessions result in a profitable project. In many municipalities, the master developer pays his own way, and any impacts resulting from the project would also be his responsibility. However, many municipalities take advantage of a developer's land-use request and impose off-site improvement requirements that existed prior to the land-use application. This regulatory practice of seeking corrective measures for insufficient or inadequate infrastructure on the shoulders of a master-planned community elevates the process into a negotiation rather than a process discussion based on the merits of the project. Adding general public comments and concerns, founded or unfounded, into the approval process clearly defines the need to have the community embrace the project concept prior to applying for regulatory approval. In some cases, this will require disclosure of the project concepts early in the process. The master developer must assess the need for a consensus-design approach or make application for public forum debate. Regardless of the approach selected, the master developer must institute a defined community-relations program to solicit input from a variety of vested interest groups and gain support prior to the public scrutiny that occurs at public hearings.

### 11.2 Chamber of Commerce

Most communities have an organization of business entities whose goal is to promote the economic benefits of the jurisdiction. Since the participants are primarily local businesses, this group is generally not involved in debating the pros and cons of proposed residential or commercial projects. This organization may however become politically active when a large-scale master plan is presented for land-use approval. This entity, although neutral in nature, will organize against a project detrimental to the overall business climate of the community. However, if the master developer remains consistent with the market studies, the land uses should complement the existing economic base of the municipality and expand the economic viability of the community.

Master developers should prepare a list of community groups to whom presentations could be made and the chamber of commerce should be first on the list. Obtaining input from business leaders will be beneficial in preparing the land-use plan but also in gaining political support of the plan once it is presented to the planning and zoning board. Developers should bring their planners and engineer to the chamber of commerce meeting. The developer should be the spokesperson for the project. The design team members present the project and answer specific technical questions. In many instances, members of the town council or zoning board are also members of the chamber of commerce. Thus the master developer should make certain that personal invitations are extended to all members but ensure that attendance by the political body or board members would not constitute a quorum and thus be illegal.

Since large tracts of land or multiple parcel projects are found in fringe areas, many municipalities are experiencing an influx of master developers from outside the community. It is in the best interest of these developers to become involved in the
activities and committees of the chamber of commerce. Not only is the networking important, but establishing a business presence is essential to the local acceptance of a company from outside the community. This participation would also benefit the developer in understanding the business community views toward growth and progress. Developer’s attending chamber of commerce events will help the developer learn about:

- community’s hot buttons;
- how these issues may impact the overall land-use plan; and
- how the developer may overcome these community concerns or issues.

Expecting the chamber of commerce to attend planning and zoning public hearings without urging would be the wrong assumption. Remember, winning at the zoning table requires rallying support for the approval of a large-scale project. Master developers should always seek local business support during information sessions and at public hearings. Request their attendance, and ask for positive testimony on the proposed plan. The master developer must prepare the necessary documentation, data, and statistics providing verification that the proposed plan is indeed a business and economic benefit to the community. Win over the chamber with promotional and business benefits fully realized from the build-out of the proposed project.

11.3 Neighborhood Meetings

Seek neighborhood and community input on project plans and goals.

Members of the general public, individually or organized, are important components of the public relations campaign that a master developer wages to gain support. Since the land-use approval process promotes community participation and public comment, the general public can become involved as individuals and not be part of an organized group. These individuals can be categorized into two classifications: (1) neighbors and (2) public advocates with an agenda. The neighbors are easily identified and typically are notified by registered mail of a proposed rezoning plan located within 200 feet of their property. The master developer should not wait for this notification to contact the neighbors. Developers can obtain a list of property owners from the local tax office.

Since large-scale projects generally have a significant perimeter property line, there may be many individual parcels affected. Each adjacent property owner should be contacted by mail, phone, or in person. The individual attention will permit a more casual and informal exchange of ideas and concerns. This is a unique opportunity to uncover the true sentiments of adjacent neighbors. These individual meetings will provide unsolicited insight on the community hot buttons and real concerns of the neighbors. The master developer will have an opportunity to assess the issues and be able to respond to their concerns through plan changes or designing to overcome their concerns. For the public hearing, there may be adjacent property owners in favor of the development, but they generally do not attend the public hearing unless asked.
Thus the developer should consider asking neighbors to attend and, in some cases, provide transportation to and from the hearing. In most cases, only those residents not in favor of the project will attend the hearing.

Other members of the general public have the opportunity to speak at the hearing. These residents have political agendas and passionate causes that are jeopardized, in their eyes, by large-scale projects. The issues although not endless in scope can be and most likely are very site specific. However, all communities have residents wanting to fight against growth and protect their way of life. Their approach is to focus on the negative aspects of the project and not the solutions offered to minimize the impact. These individuals may not be no-growth advocates but their mission is to actively lobby against any change considered in their eyes to be a detriment to the health, safety, and welfare of the citizens. Many of these advocates use the public forum for political purposes. The concerns can cover the spectrum of daily issues, including overcrowding of schools, an increase in crime, and more traffic congestion. Some individuals attend every planning and zoning hearing and eloquently voice objections on the record. Not all of their comments are self-serving, and master developers should seek out these individuals for open dialogue prior to the public hearing. The result can be to agree to disagree, but the attempt is made. This is viewed positively by the political body. It is not uncommon for the political body to disagree with the intent of these individuals, since their forum of issues are raised continuously at every board hearing without resolution. A developer may choose not to publicly respond to their comments and concerns, since they generally lack community support and lack technical credibility.

Due to the historical development patterns of most communities, neighborhoods are isolated subdivisions lacking connectivity to adjacent neighborhoods. Most disjointed subdivisions are managed by a homeowners’ association. These organizations may be a significant voice in community affairs or be relatively nonexistent—in either instance, an organized group, having one voice, should be viewed as politically significant. Master developers should identify each homeowners association that may be adversely or positively impacted by the proposed project. Separate meetings should be held with each association board of directors to present the project plans, concepts, and visions. Each meeting will also be a approached as fact-finding opportunity, identifying key issues and problems. The intent is for the developer to find a middle ground on the issues. Discuss practical and reasonable solutions to the problems raised. Not all problems or concerns can be resolved. The developer should make the attempt to resolve issues with the project adversaries.

After meeting with the association leadership, it may be necessary to request a special meeting with the association members to present the project plans, design concepts, and uses proposed. A “dog and pony” show is needed to illustrate the thought process involved in conceptualizing the project. Design team members need to be present and to properly address specific technical questions. In most cases, it is better to present progress plans and not the final product. The public will become more part of the process if they are asked for their input. Promoting resident input during the project-design programming phase is well received and generally beneficial to the developer.
At the neighborhood meetings, the developer should arrange to schedule an early evening meeting and provide drinks, food, and printed hand-outs. Keep the meeting structured and on time. Allow ample time for all questions. Be factual. Have the residents sign in and write down their questions for ease of reference. The master developer and design team members should welcome the residents in an informal gathering before the presentation and have colored illustrations located throughout the room so small groups can gather around each display. Design team members will be positioned at each display to answer questions informally. This presents a less formal gathering, allowing residents to be more comfortable and willing to engage. At the end of the meeting, the developer and design team members are also available to answer lingering questions and concerns.

Having an open debate of the issues and impacts allows the developer to further assess the issues of importance to each association. An all-win scenario is for issues raised by the neighborhood groups to be properly addressed in the project designs. The cost of resolving any community impact must be properly documented and not forgotten once the design plans are underway. The best approach is for the developer to officially report back to the association with solutions and timeframes. Implementing any solution prior to the hearing is beneficial but not necessarily advantageous.

The entire process of gaining public support is a negotiation and consensus-building process. Issues not resolved are addressed during the planning and zoning board hearing. The association presentation should also be considered a dry run for the public hearing phase. Even if the initial discussions are based on conceptual drawings and held early in the planning phase, prepare excellent graphics, price points, architectural drawings, themes, materials, and colors for disclosure at each meeting. The public will form their opinions based on these meetings. In some cases, their impressions may change. However, their attitudes will change only when the master developer does what they say they will do. There are no second chances with the general public.

### 11.4 Public Hearings

Property rezoning requires a step-by-step application and review process culminating in a public hearing before the planning and zoning board. For large-scale project land-use plans, the master developer should anticipate multiple hearings. It is not unusual for the presentation and expert testimony to take more than one meeting. This allows the developer to establish a record of the project facts. Each board manages applications differently; but, typically, the applicant presents their entire case before entertaining public input. It is customary for boards not to allow commentary from the public but seek specific questions from the public about the application and testimony. Citizens are much more sophisticated about the land-development business and the impacts caused by growth. They voice their opinions at public hearings and are much more aware of the issues confronting developers seeking regulatory approvals. Many citizen groups and homeowner associations retain land-use attorneys.
protecting their interests and ensure the regulatory process is adhered to. Master developers should orchestrate the presentation with the design team members.

Public Hearing Preparation

Master developers should initiate their preparation very early in the land-use planning process, before the planning and zoning board submission and hearing. This effort should be continuous up until the night of the hearing. Considerations in preparing for the board hearing would include:

- attending a hearing to understand the board traditions
- becoming familiar with the hearing room
- knowing current community and political hot buttons
- knowing your costs and the cost of hot buttons
- meeting with board members, if possible
- preparing order of presenters and ensure that presentation is in lay terms
- practicing role playing with all consultants required to make a presentation
- reviewing all graphics to be used the night of the hearing
- preparing responses to all unresolved community opposition issues

Planning and Zoning Board Hearing

The night of the meeting can be an electric atmosphere due to the magnitude of the project and the impact it will have on the community. Master developers need to control the environment surrounding the spectacle of the evening by projecting a sense of calm and professionalism. The perceptions of the development team will resonate throughout the audience, and it is essential for the design team to have confidence, positive body language, and be upbeat. The following tips, if followed, will also better prepare the design team for the public hearing:

- do not dress less formal than board members
- know where the project is on the agenda
- arrive at the board meeting before the meeting starts
- talk with the staff and board members prior to the meeting starting
- sell the “sizzle” of the project
- have excellent graphics for each design team member
- provide handouts to board members of the presentation material
- show enthusiasm for the project design
- be genuine and professional in the presentation
be respectful to the board member and general public
show sincere interest in public comments
answer “yes” and “no” questions with “yes” and “no” answers
provide brief and concise answers
know which board member will “move” to approve the project

The financial commitment of buying land, preparing a land-use plan, and constructing a large-scale project is substantial. To obtain the entitlements necessary to proceed with property sales is contingent upon the success of the developer and design team members prior to and during the public hearing. All too often, developers become overconfident and do not adequately prepare for the public hearing. The hearing is the forum in which the project details are opened to public scrutiny. And since the developer is asking the municipality for an approval they do not have to grant, the effort in preparing the illustrations and presentations must be comprehensive and of the highest quality. Thus, retaining highly regarded professionals, spending the time to meet with neighbors, and preparing a professionally orchestrated presentation cannot be overemphasized.

Do not take anything for granted. Be prepared, and select design team members with local political and business connections. It is also important to have the principals of the design firms involved attend the public hearing. Have the design firm project managers in attendance for answering specific technical questions. Developers should insist that well-seasoned professionals present the project. The project is not the time to have a professional with limited public hearing experience be the lead consultant. Having consultants from outside the community may be beneficial in design and concepts, but the primary consultant should be a local professional.

In many municipalities, developers are represented by a land-use attorney. In other jurisdictions, an attorney may represent an adversarial approach and this would cause board members to become more cautious in their actions. If it is not customary to have an attorney present, it may be best to have the attorney on the design team but not have them present at the hearing. In many jurisdictions, the master developer would orchestrate the presentation order; in other municipalities, the developer is only there to answer specific questions. Every municipality has its own regulatory process and board traditions. It is incumbent upon developers to have a local engineer be the lead design team member at the board hearing.

Boards will focus on technical concerns, including water supply, sewer availability, environmental impacts, drainage, and traffic issues. The public and board members will also be concerned about property values, architecture, landscaping, house price points, and nonresidential tax-ratable issues. Each design team member providing testimony should have specific questions or issues raised during the neighborhood and community-relations program to answer during their presentation. A possible order of a public hearing presentation could be:
<table>
<thead>
<tr>
<th>Role</th>
<th>Responsibilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Master Developer</td>
<td>Introductions, company overview, previous projects, project overview, site data, project goals, and community vision.</td>
</tr>
<tr>
<td>Environmental Land Planner</td>
<td>Outline environmental constraints of the site.</td>
</tr>
<tr>
<td></td>
<td>Describe site constraints and land-planning opportunities used as a basis for design. Present the land-use plan, design program, and description of proposed land-uses in terms of anticipated residential-unit counts and parcel sizes; describe proposed commercial, office, or industrial uses. Discuss impacts on the school district.</td>
</tr>
<tr>
<td>Civil Engineer</td>
<td>In lay terms, provide an overview on water and sewer availability, primary road alignments and access points, and drainage concepts; also, outline phase one of the project.</td>
</tr>
<tr>
<td>Traffic Engineer</td>
<td>Presentation of the traffic report. Include discussions and/or approval of the report by the DOT or by the jurisdiction responsible for off-site road improvements. Provide regulatory credibility to the findings of the report.</td>
</tr>
<tr>
<td>Landscape Architect</td>
<td>Show pedestrian connectivity, entry-feature designs, landscape corridors, and open-space uses.</td>
</tr>
<tr>
<td>Architect</td>
<td>Present illustrations of building elevations for residential and nonresidential uses; common-area amenities. Reinforce project vision. Discuss materials and color.</td>
</tr>
<tr>
<td>Master Developer</td>
<td>Outline ownership and maintenance responsibilities, build-out schedule, recap of project vision and concepts, and outline the benefits of the project for the community.</td>
</tr>
</tbody>
</table>

### 11.5 Citizen Involvement Programs

Large-scale projects require special attention to ensure success at the zoning table. In most jurisdictions, projects zoned by right or designed in accordance with the local ordinances may not receive any opposition, but a large-scale land-use plan requires local government permitting a change in uses based on a comprehensive land-planning and marketing approach. Due to the political ramifications surrounding a large-scale project, board members, council members, and the general public are in a position to influence the outcome of the project. Due to this influence, developers should create a citizen involvement program. This program would include setting a defined schedule to involve the general public. This program could include small
gatherings with adjacent neighbors and neighborhood groups as the land plan is being conceptualized. Bringing the neighbors into the design process can be a double-edged sword, but if properly managed may win over the skeptics.

The design team should also hold public meetings throughout the design process leading up to the public hearing. Hold these meetings at a local high school, hotel conference center, or a local church. The approach is informal but fact finding, and it provides an opportunity to disclose design concepts as trial balloons. Send out invitations to citizen groups or request to be put on the next agenda of their group meeting. Not only will these forums allow for the distribution of factual information, but they will help dispel any gossip surrounding the project. Developers should take advantage of the forums to inform the citizens about the regulatory process, the cost of development, and the benefits of the planned community. They should also take advantage of the audience and inform them of their role in the process.

11.6 Public Awareness Programs

Another way to convey the benefits of the project is to establish a strategic public relations program. This program would include periodic newspaper articles, direct mailing of project information, advertisements, billboards, and special events. The goal of this approach is to elevate the public awareness of the project and to introduce the project’s design attributes to the general public. The intent is also to create name recognition. Best suited to assist the developer in this effort would be a public relations firm. Select a firm with a regional presence and advertising capabilities. This firm would also prepare educational material about the project for distribution. The intent is to create positive name recognition as the plan is being disclosed at neighborhood meetings.

11.7 Community Hot Buttons

Success at the zoning table is contingent upon many transparent factors. However, the most important due-diligence issue yet to be uncovered are the community hot-button issues (see Fig. 11.1). These issues are neither written nor publicly disclosed regulations; instead, they are significant health, safety, and welfare points of discussion that are not to be overlooked during the land-use design process. In markets that have sustained significant growth pressures, the hot button issue could simply influence growth through managed- or slow-growth initiatives. Although not written, the political arena will react negatively to even a well-conceptualized master land-use plan if the political will is to slow growth. Not all hot buttons are cost issues. Hot buttons with financial consequences are, at least, easier to address, since the design aspect can be accommodated and a budget established for the line item. The art of land development negotiations is based on knowing what can be agreed to and when to agree to it. The art of rezoning is contingent upon the master developer listening, recognizing, and deciding which issue to debate and which to require concessions on.
Figure 11.1 Community Relations. Developers of large-scale projects alter the dynamics of the local community. The project vision and concepts should be embraced by the public. This can be achieved through consensus-building programs.

If the master developer is not adept at the art of local land-development negotiations, the project will surely be delayed. A delay in the process is typically more costly than achieving a resolution to a hot-button issue.

11.8 Summary

Master-planned communities provide a tremendous opportunity to create a financially successful project embraced by the local community and its political leaders. The size of the project in acreage, residential units, or nonresidential uses complicates the land-use rezoning process—after all, government does not have to grant a rezoning. Community input and positive community relations are essential ingredients to processing a plan through the regulatory process. This will result in minimizing carrying costs, containing risk, and establishing a marketing momentum for the project. Without the public embracing the project, a master developer will be run the risk of delays, disapproval, or a financially marginal project, all of which would be unacceptable. The master developer must also recognize the groundswell of
public opinion. It is advisable on occasion to walk away from a project rather than force an unacceptable approach, since the build-out time spans many years. If the master developer creates an effective community-relations program, orchestrates the regulatory process, and gains public support, a well conceptualized land-use plan has a better chance to be financially sound by limiting the cost of concessions and resulting negotiations.

**DISCUSSION TOPICS**

1. What measures can be taken by a master developer in “selling” the land-use plan in a no-growth market?
2. Should the master developer be a visible entity in the regulatory process, or should the design team members serve as spokespersons for the project?
3. Should the master developer meet with the opposition on more than one occasion?
4. Will the master developer of a well-conceptualized land-use plan fail at the rezoning hearing with an ineffective and noncommunicative design team?
Engineering Design Standards

12.1 Introduction

Criteria governing infrastructure design is as diverse as the number of municipal governments across the country. Local government typically adopts an ordinance establishing design criteria and standards governing how land-development projects are designed. Although the engineering discipline is the thread through the entire development process, the master developer should be familiar with the requirements imposed upon the engineering designer. A general knowledge of land-development engineering will permit the developer to generate constructive discussions with the designer and regulatory staff.

Land-development standards are typically different from one jurisdiction to another. Many standards are antiquated, and many land-development ordinances require revisions to adequately address new planning and land-use concepts. Since the land-development industry is fragmented, the engineering discipline associated with land-development projects is disjointed as well. The lack of a local and united association of land-development engineers fails to elevate the engineering discipline into a position of influence. It is not uncommon for a jurisdiction to establish a working group charged with reviewing and recommending land-development design changes. Since many of these standards are established by consensus, the engineering community is only one component in the debate and very rarely the leader. Most local ordinances are minimum-maximum criteria permitting design flexibility but not necessarily practicality or cost effectiveness.

Master developers should retain the services of a large multidiscipline engineering firm for their large-scale project. The interconnection of land-use areas and the core infrastructure design requires coordination and cooperation during the design and construction phases. Coordinating one firm during the design process would expedite the review and approval process.
Chapter 12 Engineering Design Standards

The master developer should have personnel assigned to manage contracts, field operations, and quality control. The depth of qualified field personnel is limited, and many developers are seeking assistance from their engineering firm to administer and manage field operations. In many instances, lenders are requiring a third-party inspection. They also are requiring a third-party review of invoicing before payment is made. In this case, the American Institute of Architects (AIA) invoice format is typically used in processing invoices. Land-development activities expend tremendous sums of money in short periods of time. All projects are in a negative cash-flow position at the start of a project. However, in land planning and land-use allocations, if there is a site that can be subdivided, sold off, and closed immediately following the land-use approval, the negative cash-flow shock would be softened.

This chapter on engineering-design standards will address typical design approaches, land-development criteria, review and approval considerations, and construction consequences for each element of design.

12.2 Grading and Site-Clearing Operations

Although land-development sustainability design is difficult to conceive, there are benefits to retaining existing vegetation on-site. The ability to save trees and existing vegetation starts with the land plan. Traditionally, hopscotch developments considered tree-save areas to be a cost implication rather than a positive attribute of the site. The economy of scale in mass grading and clearing operations were embraced by developers in constructing traditional subdivisions. For a large-scale project, the master developer should approach the land-clearing and grading operations quite differently. Large-scale projects are designed comprehensively to use land properly and to allocate proper uses complementing the land form and location.

Many sites have natural tree stands that should be saved in clusters, and if possible, specimen trees should also be saved. The mature trees and vegetation on-site should be retained, since it is not cost effective to duplicate the caliber or height of mature trees. Master developers should concentrate on the frontage road or “marketing window” and the first phase of development. With the design engineer, the initial phase of construction should be designed to balance the cut and fills on the main entrance road to serve the first phase of development. Minimize earthwork operations for the initial phase by constructing the rights-of-way only and maintaining existing vegetation along the edges of the rights-of-way lines. Along the property frontage, selectively clear approximately 25 feet to cleanup the site and to supplement any open areas with new hard and soft landscaping (see Fig. 12.1).

Upon completion of construction documents, have the surveyor stake out the centerline of the entrance road to the first phase of the project. The master developer should walk the centerline with the engineer, landscape architect, town engineer, and contractor to assess any field problems or to adjust the centerline if needed to retain an important characteristic of the site. Since specific tree surveys are limited due to the expense in locating all trees of a specific caliber or species, the design team should be flexible in changing the alignment of the main road to retain significant existing trees
Figure 12.1 Clearing and Grading. Development operations will span many acres of land. Clearing and grading operations may be completed in a short period of time; but they will cost significantly more than most elements—and be highly visible.

or vegetation that cannot be cost-effectively duplicated. Having the town engineer walk the centerline with both the developer and design team to discuss alternative design approaches while in the field is beneficial. The approval of the design change may be addressed separately with the regulatory engineer.

The surveyor will stake the clearing limits for the initial core infrastructure and phase one of construction. Phase one may only include the welcome or sales center, but staking the clearing limits of the entire first phase is beneficial in setting the pattern and approach of development. The clearing limits may need to be defined in the field by using an orange construction fence. The master developer should have the landscape architect involved in the placement of the protection fencing, so field adjustments can be made at that time. The orange protection fencing provides a clear demarcation for clearing and earthwork operations to follow. Municipalities may require an as-built survey of the tree-save areas, ensuring cleared areas do not encroach on the areas that are to remain natural (see Fig. 12.2). If a problem occurs, the developer will have to mitigate the cleared area by planting additional trees in the area. Generally, the mitigation would be on a 2:1 ratio.
For areas to be cleared, the contractor must remove the debris. The area must also be root raked to ensure all roots are removed from the cleared areas. Open burning, high-intensity burning pits, and logging may be practiced in parts of the country. Typically, however, developers will have the contractor chip the entire site and remove the stumps for grinding on-site. This will result in a large stockpile of chipped material. The engineer and developer should select an area designated for stockpiling chipped material.

The construction plans should also delineate locations for topsoil or fill-material stockpiles. Locations should be accessible for ease of construction, but they should not hinder the first phase of construction nor be visible from the frontage road. The ability to control grading operations is enhanced if the project contains a golf course. Discussion with the land-development contractor not only includes schedule and completion dates but also defines material storage and equipment-staging areas. The master developer should require contractors to keep a well-maintained site during construction. Site presentation is as important during construction as the final product.
If the frontage-road design includes landscaping berms, the topsoil removed from the main entrance road can be moved once rather than stockpiled and moved again.

At the beginning of the project, the master developer will have simultaneous operations under way, requiring the developer's full attention. The importance of having a defined schedule cannot be emphasized enough—especially at the initial stages of construction. The clearing and grading operations are the first stages of construction. The contractor must be made aware of the schedule and the importance of being on time and within budget. Construction activity signals to buyers that the project is indeed real; it also spurs selling activity. The master developer must include the first phase of development in the initial construction activities. The builder of the first land-use pod should be a reputable and a well-established company within the local marketplace. Coordinating land-clearing and grading operations with the various builder-developers will ensure a smooth transition between areas of responsibility.

During earthwork operations, the master developer should have a geotechnical engineering firm on site for soils and materials testing. This firm will determine the quality of the on-site material for various uses. A quality control program is essential for land-development-construction activities. The initial core infrastructure will be in place during the entire build-out of the large-scale project. In many cases, this build-out period may last several to many years. During this period, subquality infrastructure is noticeable and considered a detriment to sales momentum. Quality infrastructure generally goes unnoticed, and this is the goal of the developer and contractor. To ensure this goal is achieved, the master developer must again rely on the design team to assist in field management, administration, operations, and inspection of on-going construction activities.

The clearing, grading, and earthwork operations set the stage for the project. Grading the main entrance road will create the visual presentation of the project and be reflective of the engineering design. The surveying component to stake construction components should be subcontracted by the contractor. This will permit the contractor to manage the schedule more efficiently rather than always asking the developer to schedule stake-out work. Also, restacking costs to the developer are generally minimized if not eliminated. Many earthwork contractors are using global positioning systems (GPS) to guide equipment to better reflect the engineering construction drawings. In this event, the design engineer must provide electronic files for the contractors' use. The master developer should work closely with the design engineer to continually assess the cut and fill requirements of the project.

For the master developer, managing earthwork movement from phase to phase is a challenge. During the engineering design of the grading of the site, the master developer would be best served by having the earthwork contractor review the plans before they are finalized. The contractor should outline how the site will be prepared for subsequent land-development activities. Thus, once operations are underway, everyone has a clear understanding of the actions to be taken for achieving a project delivered on schedule.
12.3 Soil Erosion and Sedimentation Control

Contractors hired to build the infrastructure will be required to install soil-erosion and sedimentation-control devices before the clearing and earthwork operations commence. This element of work will follow the design plans prepared by the civil engineer. This plan is reviewed and approved by the Soil Conservation District. A separate permit is issued for the project, allowing the developer to commence construction only if in compliance with local regulatory requirements. The soils plan is valid for only $3\frac{1}{2}$ years and must be renewed to remain valid. The Soil Conservation District has the power to levy fines for not following the approved plan. In many jurisdictions, the soil-erosion and sedimentation-control plan is prepared in two phases. Phase one is a plan providing protective measures for clearing and earthwork operations only. Details on how to install each element of the erosion-control plan are provided in the construction documents.

Phase one will generally consist of a stone tracking pad at the entrance to the project site for construction equipment access. A silt fence will be installed in accordance with the approved plan, and it will generally follow the clearing limits and tree-protection fencing. Temporary sediment basins should be installed as per...
plan. These basins are located in low areas and are designed to control and contain storm-water runoff during clearing and grading operations. The silt fencing must be continuously inspected and maintained. The basins are located in areas to be converted into either storm-water management or best management practices facilities.

Diversion ditches may also have to be installed to convey runoff to the basins. The phase one plan will also include a construction sequence and seeding specifications. Any area disturbed and inactive for more than 21 days must be stabilized to prevent erosion (see Fig. 12.3).

Phase two of soil erosion and sedimentation control is provided in conjunction with the land-development activities of the project. As utilities, drainage facilities, and roadways are installed, the erosion plan alters the temporary sediment basins into permanent storm-water management systems. The drainage system, which contains storm drain inlets, must also be protected during construction. Inlets will be protected with stone check dams or filter material placed over the grate. This protection may be removed once the road surface coat has been installed. Each land-use pod will have its own soil-erosion plan and not be linked to the core infrastructure plan implemented by the master developer. The sediment basins can be removed once the uphill area has been stabilized with ground cover and approved by the soils inspector (see Fig. 12.4).
Chapter 12 Engineering Design Standards

The infrastructure installed by the master developer can be installed and stabilized in a relatively short period of time. For individual land-use pods, the soil erosion and sedimentation control devices are generally maintained throughout the building construction phase by the builder-developer. Since each land-use pod is a segment of the entire community plan, the master developer should also ensure all areas remain in compliance with each soil-erosion-control permit issued. As a master plan, each individual land-use pod will ultimately direct storm water to a floodplain, stream, or channel for conveyance downstream. The master developer will be responsible for the common areas within the community and, therefore, should ensure each area under construction properly implements the soil-erosion and sedimentation-control plan.

12.4 Water-Distribution System and Supply

Most large-scale projects will require a water main extension or an upgraded water-storage facility to meet the demands of the new community. The due-diligence analysis would define the issues, and upon completion and approval of the land-use plan, the master developer must focus on the technical design of the potable water system. Adequate water supply and water pressure for fire service capabilities should be assessed from the inception of the project. The water mains servicing a large-scale project are generally 8 inches or greater in size. The project design would require the extension of the off-site water main into the community, most likely at the same size as the existing water main. In some cases, a 10 or 12 inch water-line extension may be required. Any off-site utility extension may permit the master developer to negotiate a developer’s agreement, which may include a rebate on the cost of the larger water main if not needed for the entire project.

The initial phase of development should be designed with a looped water main system for ease of extending the lines into the various land-use pods. For future extension, the design plans should also show stub lines to the various platted parcels. Water mains serving the specific land-use pods will normally be 8 inches long. The pipe material will typically be either PVC (polyvinyl chloride) or ductile iron pipe (see Fig. 12.5).

There are several considerations in water-line design that should be reviewed and understood by the master developer. The location of fire hydrants and vertical conflicts between the water main and other utilities or storm drains should be adequately reviewed before submitting the plans for regulatory approval. The developer may decide to meet personally with the fire marshall to obtain his or her review and input. This approach is beneficial to ensuring that the plans are consistent with the preferences of the fire department. The vertical conflicts can be calculated once the project has been designed for drainage facilities and grading of the site.

A maximum distance between fire hydrants is also a standard requirement. In most jurisdictions, this separation distance is 500 feet. Compliance with this requirement can be illustrated by showing 250-foot radius circles centered on each fire hydrant. Every house or building should be contained within a circle for proper fire coverage.
Figure 12.5 Water-Distribution Systems. Water systems are taken for granted. Turn on the kitchen faucet, and there shall be water. Fire flow pressure, water capacity, water quality, and construction costs are technical in nature, but each issue separately may impact the viability of the entire project.

The linear distance between fire hydrants measured along the curb line should also be calculated for compliance. The location of each fire hydrant should also be reviewed for access and visibility.

Water-line installation will generally be inspected by government inspectors. If local government requires the design engineer to certify that the water and sewer lines have been installed in accordance with the design plans, the developer should retain the design engineer for construction-observation services. The design engineer must determine the level of observation necessary for them to sign and seal the as-built water and sewer plans.

Water supply is also a critical issue for the entire large-scale project. This issue, however, should have been assessed during the due-diligence period, and the conclusions reached at that time would govern the course of action of the design engineer. In parts of the country, water rights are required to use the water resources for land-development projects. Also, private supply wells may be needed for certain communities. In addition to the public water supply, irrigation wells will need to be drilled.
for irrigating common area. In certain instances, the master developer may want to reserve water capacity for the entire project. Discussions with the municipality should be ongoing, and the water availability issue resolved before the land is purchased. The water pressure in the existing water main is as important to the development potential of the site as is water availability. Testing of the existing water lines should be accomplished during the due-diligence period. Once in design, the lines should be retested for accuracy of the test data. Adequate water pressure is required for fire-protection capabilities.

12.5 Sewer System and Treatment Facility

The location of the sewer connection will dictate the design approach for the project. A sewer trunk line is the major conveyance system for the existing community. The design of the land-use plan should illustrate the sewer-connection location, and the phasing should incorporate this design approach to minimize cash flow at the start of the project.

There are instances when the local jurisdiction has anticipated growth. They pursue the expansion of the treatment-plant capacity to meet future anticipated needs. If the treatment-plant design has been submitted to state and federal agencies, the process has at least been started. However, the master developer should not rely on their projected schedule to complete the expansion. The developer needs assurances that the plant will be ready for the additional capacity generated by the new project. The master developer must not accelerate the land-use planning and approvals without the assurances of treatment-plant capacity being available.

If the large-scale project has to be designed with a lift station before connecting to a gravity sewer trunk line, many jurisdictions will strive to eliminate the lift station so as not to incur more operational and maintenance expenses. During the due-diligence period, the engineering report should include an assessment on how the project will connect to the existing sewer. If the report indicates a lift station is necessary, the master developer needs to obtain resolution on this matter early in the process. Generally, the sewer lines within the project will be designed as 8-inch sewer lines. The material of choice by most jurisdictions is PVC pipe. The key to a cost-effective sewer design is maintaining shallow manhole depths, up to 10 feet below grade. There is also a minimum cover required over the sewer line.

In sewer-line design, municipal utility engineers will stipulate a maximum distance between sewer manholes and the location of the line within the street right-of-way (see Fig. 12.6). Minimizing the number of manholes is a goal in managing the land-development budget. Most utility engineers will require a maximum of 400 feet between manholes. There are some sewer agencies that have extended this maximum separation criteria to 500 feet. Many sewer-reviewing agencies are firm on their criteria, which is based on their operation and maintenance capabilities. Many departments require the manholes to be located on the centerline of the roadway. On curves, these departments generally require additional manholes rather than to deflect the pipe in accordance with manufacturer specifications.
The master developer will be responsible for the main trunk-line connection to the existing sewer line. The treatment plant capacity should also be reserved for the entire project. Thus, each individual land-use pod will have water and sewer facilities. The core sewer-line design should provide an 8-inch sewer-line connection to each land-use pod. It is, therefore, important to know where the road accesses will be located for each land-use pod. The land-use plan and subsequent engineering plans should be designed based on preplanned intersection locations for each individual land-use pods. Depending on the topography of the project, the sewer trunk line should be at maximum depth to ensure all upland areas suitable for residential and nonresidential use can be serviced by a gravity sewer.

There are alternatives to a gravity sewer, such as a pressure-sewer service. This system provides for individual grinder pumps located at residential dwellings and connects to the existing sewer line by a small diameter force main. This system has its advantages in severe terrain and on essentially flat properties. This system would also require a special permit. A master developer would evaluate a gravity-sewer system with a lift station for the community as the first option after a gravity sewer.
12.6 Internal and External Road System

The master developer is responsible for the core road system serving the entire community for ingress and egress to each land-use area (see Fig. 12.7). The hierarchy of roads serving a large-scale project includes residential collectors and various residential-road classifications. These roads will generally have specified pavement widths, curb requirements, sidewalk criteria, and street-tree-planting standards. The community land-use plan and the core infrastructure layout will be analyzed by the traffic engineer as the plan iterations are being prepared.

The primary collector road connects various uses within the community and is the primary link to the existing transportation system; many developers design this road as a dual roadway with a center median. The typical section of this road may include a 60- or 80-foot right-of-way, with pedestrian pathway systems along both sides of the road, curbing, and 24-foot-pavement widths for each side of the median. This would allow two travel lanes on both sides of the median, which will also be curbed and mounded for landscaping, signage, and lighting. The median width will vary, but it is typically 8 to 10 feet wide. The pavement section or depth of the paving is...
material will also be more substantial for the collector road. It is in the developer’s best interest to have the geotechnical engineer provide soils testing along the collector road and design the pavement section based on the existing soils. This paving design approach should provide the optimum depth of pavement material suitable for the use, longevity, and integrity of the road.

In most cases, the collector road will be accepted for maintenance by a municipality once the developer has completed the maintenance period imposed by the municipality. During this period, which is generally two years, the developer will have a maintenance bond in place with the municipality. After the two-year timeframe, local government will inspect the road and associated infrastructure elements. They will provide the developer a punch list of deficiencies. All of which would have to be corrected before the maintenance bond is released. After the maintenance period has been completed, government will accept the road for operation and maintenance.

It is unlikely that a large-scale project will have only one main residential collector that connects all of the land-uses together. Based on the land-use plan, the road network will include other connecting roads that will have to be constructed by the master developer. The construction costs and cash-flow requirements are significant for road improvements. Thus, the importance of a phased land-development design must be emphasized during the land-use planning stage. The main roads should be designed to complement the land form and not require major cut-and-fill operations. The road’s horizontal alignment will also be governed by local standards. In many jurisdictions, the minimum horizontal radius is 250 feet rather than a 100-foot centerline radius to improve the streetscape, design flexibility, and reduce vehicle speed. Most residential roadways are designed using state highway–design standards, which are not conducive for a pedestrian-oriented and sustainable-community design. The road design should be implemented to control traffic speeds and enhance the street scene.

Because of the interstate highway design mentality, many roads in large-scale projects are overdesigned and detract from the idea of building a sustainable community. Curvilinear roadways provide traffic calming, and the street scene is enhanced due to the constant changing of the view angle. With horizontal curves, the alignment can accentuate view opportunities within the site.

The master plan submitted to local government for zoning approval should include typical road sections applicable for the various applications within the project. Traffic-calming devices, such as roundabouts or traffic circles, should also be included in the concept planning. The application should define each major road by specifying the pavement width and right-of-way improvements associated with each road system. In most cases, the core infrastructure roads will not have on-site parking. However, in the individual land-use pods, on-street parking may be considered. This will affect the width of the road. The main core roads may also be designed with bike lanes within the paved area and delineated by stripping.

Regulatory agencies impose minimum and maximum criteria on the vertical alignment of roads. The minimum grade most often used in design is 0.5 percent. The maximum grade will vary depending on the location. However a maximum grade of 15 percent is widely used by municipalities in governing road design. Vertical curves
should be designed to permit ample sight distance with intersections from the various land-use pods throughout the project. Standards are also established for the length of vertical curves in relationship to the grades forming the vertical curve. In some municipalities, a design speed for residential applications governs the roadway design. In other jurisdictions, the road design is governed by the minimum and maximum criteria outlined in their land-development ordinance.

The standards governing residential road design lacks consistency between jurisdictions. The master developer should work with the civil engineering firm to prepare road-design standards that complement the land-use approach for the project. Developers should seek regulatory approval of the land-use plan incorporating the hierarchy of road standards and design criteria based upon each type and use of road.

12.7 Drainage Facilities

Engineers will evaluate the entire land-use plan and determine an overall drainage-concept plan for the project. This plan would include the primary drainage system to be constructed by the developer. A decision must be made on the centralization or decentralization of storm-water management (SWM) and best management practices facilities. Phase one of construction and core infrastructure facilities will be designed first and must be consistent with the overall drainage concept for the project.

Decentralizing the drainage system, water-quantity-control facilities, and water-quality-control devices would limit the construction responsibility of the master developer. The developer would only have to consider the facilities associated with the main core roadway system, common-area amenity sites and open-space areas. Even the nonresidential areas would be required to drain, contain and clean the runoff before it leaves their specific site. This approach also reduces the net buildable area because buildable land must be set aside for these types of facilities.

Centralizing the drainage facilities would allow the individual land-use pods to connect directly to a core drainage system conveying runoff to water-quality and water-quantity-control facilities. At this facility, the runoff is treated and the quantity of runoff is released off-site at a rate consistent with the predevelopment conditions. This approach also would allow more buildable area on each land-use pod. Since there would be more land available for development options, property values would increase. The primary drainage system would be designed to accommodate adjacent land-use pods. The individual project-engineering designs would have to be reviewed by the developer’s engineer to ensure compatibility with the overall design of the drainage system (see Fig. 12.8).

Conveying storm-water runoff to an acceptable outlet is a necessary and important component of the infrastructure system. The design approach is complex and the results are costly. The engineering design of drainage facilities must comply with local standards and criteria. Most closed-drainage facilities for residential community applications are designed for a ten-year-storm event. However, the developer may consider having the main boulevard drainage system designed to a 25-year-storm event. The main road into the community should be designed to diminish spread
of water on the roadway during rain events. The drainage system would be able to convey downstream runoff generated from a more intense storm. This would allow the road to be free of standing water and more accessible for the residents and emergency vehicles. There is a cost associated with this design approach, but the roadway will function more efficiently during adverse weather conditions. Adjacent land-use pods would also be able to tie into this system, and the drainage pipes would be designed to accommodate the projected flows.

Advanced technology implemented for drainage-system design and construction techniques have not been fully realized. The most significant advances have been in alternative pipe materials. However, the local public works department will enforce the municipal land development ordinance, which will outline design criteria, specifications, and standard details. This technical document would also be used for the drainage system located within a private road system. Drainage-facility design is “out of sight, out of mind,” until it no longer functions properly and flooding occurs. This creates a public outcry, and the public works department receives the complaints. Thus, their requirements imposed on new projects limits innovation and creativity.
Alternative pipe materials and reduced pipe sizes are generally not embraced by local governments. For drainage design, the minimum pipe size differs between municipalities; however, the minimum size varies from 12 to 18 inches. The material of choice is reinforced concrete pipe (RCP). This type of pipe can have different structural characteristics for varying covers and loads. Class III RCP is common for standard drainage-design practices.

In many states, the storm-drainage design will be reviewed by local government, county agencies, soil conservation districts, state agencies, and perhaps the U.S. Army Corps of Engineers. The engineer selected for the overall drainage design must have the regulatory knowledge to provide an acceptable design. The engineer must also have the government relationships to expedite the review process at all levels. Before the land-use plan is finalized, the engineer and developer should meet with the various regulatory agencies to discuss drainage concepts and design issues. Efficient storm-drainage design minimizes cost to the developer but provides design flexibility for the individual land-use pods. Implementing an approved comprehensive storm-drainage-design concept is another benefit of a master-planned community, that is, addressing the larger picture of development practices.

12.8 Storm-Water Management Facilities

For many years, new projects have been required to discharge runoff from the project site at a quantity equal to or less than the runoff generated from predevelopment conditions. As with any type of land-development activity, replacing a pervious surface with an impervious surface will increase the amount of runoff. For a rule of thumb, the master developer should set aside approximately 10 percent of the upland land area for storm-water management facilities. Dry detention basins and retention ponds are common storm-water management (SWM) facilities (see Fig. 12.9). A detention facility holds the runoff from a site and releases it downstream over time. The basin should be dry most of the time, and the basin should provide an underdrain system to ensure the basin drains. A retention pond has a permanent water surface, and the storage of runoff is above the permanent water surface. Both facilities will have control structures regulating the flow discharged from the facility.

Establishing community wide storm-water management facilities will control runoff from all land-use pods. These facilities should be located within common open-space areas of the project. The developer may consider a retention facility for highly visible locations. Many large-scale projects locate wet ponds at entrances, recreation facilities, or near nonresidential uses. These facilities will be platted into parcels owned by the community association. The design of the pond should include additional safety measures include providing: a maximum depth, safety ledge, 4:1 side slopes, mowing edge along the high water line, and fencing in some cases.

If the large-scale project includes a golf course, the storm-water management facilities should be incorporated into the course design and have the entire project drainage area controlled by basins also acting as hazards within the golf course. Otherwise, include ponds or basins in common areas with passive recreational uses.
Nonresidential uses should maximize their buildable area to maximize the value of the property. Thus, the runoff generated from high-intensity type uses would be conveyed to a central facility. This facility would become an amenity within an open-space area. It is possible that underground storage may be required in lieu of using uplands zoned commercial as a SWM basin.

Operation and maintenance programs have always been an issue with local government. In a large-scale project, this is resolved by having both homeowner and community associations responsible for maintaining common areas. It is in the best interest of the developer and subsequent association board members to have these facilities operate properly and properly maintained since the build-out period will be long (see Fig. 12.10).

Most municipalities establish their basin-design criteria to accommodate a 50-year storm event. Others may require controlling the pre- and post-runoff based on a 100-year storm event. For maintenance purposes, the basins need to be accessible. It is not uncommon to have a municipality require fencing and landscaping around a basin. Storm-water management facilities are open-space elements designed into the project landscape. Fencing and additional landscaping should be a consideration but not a requirement. As municipalities begin to accept these facilities for operation and
Figure 12.10 Maintenance. Storm-water management facilities require maintenance for proper operation. The developer must budget for a defined maintenance program. A system failure or lack of maintenance is noticeable, damages market momentum, and affects the reputation of the developer and project.

maintenance, they will require assurances that the basins are constructed in accordance with the design plans. This will necessitate having an as-built survey completed for each SWM basin and facility. The design engineer will be required to certify that the construction is in compliance with the design. The master developer should consider implementing a construction quality-control program and have the facility inspected during construction.

12.9 Best Management Practices

Water quality has been an issue since the enactment of the Clean Water Act of 1977. Local governments are complying through the implementation of best management practices for new developments. The approach has been to require methods called best management practices (BMPs) to control pollutants in storm-water runoff before leaving the site. The pollutant removal requirement varies from 80 to 85 percent removal of total suspended solids (TSS). Best management practices can achieve
the design goals through the use of a single facility or in combination of several facilities. Municipalities have shown preferences for certain types of facilities and an unwillingness to approve others. Engineers should know the local preferences and implement SWM and BMP designs that are acceptable to approving agencies (see Fig. 12.11).

Each land-use pod integrated into the large-scale master plan should be responsible for their water-quality-control measures. The master developer should provide BMPs for the recreational facilities, amenity sites, and core roadways. Water-quantity control would be provided comprehensively by the developer. The water-quality measures are directly related to a drainage area, the topography, and the intensity of development. Many of the BMPs can be incorporated into the land plan of each specific site. Each method has an assumed TSS removal if designed and constructed in accordance with local standards and criteria. The removal rates are based on research and monitoring data. This data will vary between regulatory agencies, and their design preferences will prevail.
As with any infrastructure element, the master developer should incorporate a review procedure that each builder-developer must follow. This would provide the master developer the opportunity to review design approaches and assess the impact on the community street scene, marketability, and maintenance requirements. The operation and maintenance of best management practice facilities must be incorporated into the homeowner association documents. Best management practices are structural and nonstructural. Water-quality proponents stress low-impact development design approaches. This approach relies on open space for filters, buffers, and low impervious surfaces to enhance the water-quality control of nonpoint pollution from storm-water runoff. For a large-scale project, the common areas and intensity of development provide many aspects of low-impact development. The individual land-use pods would not be consistent with that approach, and builder-developers would rely on a combination of the following best management practices:

- Bioretention system (rain garden)
- Dry wells
- Constructed storm-water wetland
- Infiltration structures
- Pervious pavement systems
- Sand filters
- Vegetative filters and buffers
- Manufactured treatment devices
- Extended detention basins
- Wet ponds

In addition to TSS removal, many jurisdictions are requiring reduction of post construction nutrients generated from fertilizing lawns. For the master developer, the design of the main road network, amenity center, recreation complexes, or welcome centers should be designed by minimizing clearing and grading. This would minimize grassed areas. However, revegetation to the greatest extent possible would reduce maintenance costs of grassed areas and improve the overall appearance of the community, and it would use natural vegetation for filtering storm water.

### 12.10 Pedestrian Movement Facilities

Connectivity from residential to nonresidential uses will sustain the community. It is this relationship that binds the separate projects contained in a large-scale project into an interconnected community. The appeal of a pedestrian-connectivity emphasis over vehicle connectivity provides for sustainability of the community when residential and nonresidential uses are balanced to offer a live-work environment in the same project.

The land-use plan provides a layout for the primary road network serving land-use pods and the community focal point. The plan should also include a comprehensive
network of pedestrian trails, walkways, sidewalks, and bikeways. The primary pedestrian facility network would interconnect each land-use pod (see Fig. 12.12). The master developer would design and construct this network system. Each project would connect to the core pedestrian facility. The bikeway system could be incorporated into a typical road-system section by stripping along the curb line for a bike lane.

Sidewalks may be added to selected main core roadways but not necessarily on both sides of the road. The width of the sidewalk may also be increased if on one side. A 5- or 6-foot-wide sidewalk on one side may be a more practical design approach for the street scene. Also, the developer may consider not having a sidewalk along the main access road into the community, since it may be considered detrimental to the overall appearance of the entrance presentation. The main road is also the marketing window for the entire project. If installed on the main access road and it connects to the existing frontage road, what will the sidewalk connect to? Where does the frontage road sidewalk lead to? Are there locations within the community better suited for a connection to the frontage road sidewalk?
Large-scale projects will have open-space areas and site features left natural to incorporate pedestrian movement facilities. Trails and walkways should be constructed of various materials, including asphalt, pavers, mulch, stone, or other natural materials. For a sustainable community, the master developer should emphasize the importance of pedestrian connectivity during the land-use planning process. The design team should not overlook the importance of a well-designed and well-conceptualized network of walkways interconnecting all land uses. Signage may also be an integral design component of the pathway system. Passive or active recreational areas should also be incorporated in the pathway system; rest areas with benches, tot lots, playgrounds, gazebos, or open-field recreation spots should also be included.

12.11 Utility Facilities

Electric, cable, fiber optics, natural gas, and telephone utilities must be coordinated with the overall land plan for the community. Trunk-line utility systems will most likely use the main access road system for entry to the community. The design team should establish a typical road section identifying specific locations for water, sewer, drainage, electric, and gas utilities within the road right-of-way. Most new developments are required to install all utilities underground. In some areas, the utilities are located in a 10-foot deep utility easement located on the outside of the road right-of-way. This would allow the utilities to be located beyond sidewalks, to be located in areas for ease of maintenance, and not to be in conflict with any other utility.

12.12 Right-of-Way Elements

Master-planned communities are comprehensively designed for sustainability, balancing live-work relationships within the land-use plan. Included with the land-use proposal, the master developer should prepare overall land-development standards and criteria promoting pedestrian connectivity, managed-vehicle movement, and enhanced streetscapes. The standards should also balance initial cost, use, and maintenance requirements to achieve an infrastructure designed for people rather than cars. The infrastructure elements associated with the road right-of-way should be reviewed by the design team and criteria established for each element. This design program would be included with the land-use plan application.

- **Typical section**: Road sections outlining a hierarchy of roadway widths for different road classifications. Also establish the right-of-way widths for each road, minimizing road widths to allocate more land to taxable property.

- **Pavement widths**: Wider is not better. Minimizing lane widths promotes slower vehicle speeds. Maintenance costs are lower. More land is allocated to green areas rather than impervious surface, resulting in more manageable SWM and BMP facilities. Also, including a bike path within the typical section expands the use of the road.
Turning lanes: The main collector road will have turning lanes designed at land-use pod access points. Access from the frontage road will also have appropriate turning lanes into the large-scale project.

On-street parking: A decision must be made on whether to include on-street parking in both residential and nonresidential use projects. Limiting on-street parking in residential neighborhoods improves the street scene and enhances property values. This would be enforced by the homeowner association through the project covenants and restrictions. Mixed-use and town-center plans can be creative with parking locations in front of the stores or situate parking in garages located adjacent to buildings.

Stripping: Stripping roadways should be limited to the primary access roads within the community. Stripping is not necessary for residential applications except for stop conditions. The main access roads should be stripped due to the expected heavy vehicle use by passenger cars and trucks.

Signage: Street signs, stop signs, speed signs, safety signs, identification signs, road signs, and community signs can overwhelm the streetscape. Signage is necessary, and giving consideration to special designs will improve the streetscape. Standardized sign locations should be considered to properly manage sign locations within the community.

Sidewalks: The overall pedestrian movement facility plan should incorporate sidewalks into the plan for connectivity between residential uses and nonresidential uses. Consideration should be given to limiting sidewalks to one side of the street, but make it wider than the usual 4-foot wide sidewalk. Also, cul-de-sacs should have a connectivity access point at the end of the cul-de-sac to a pathway system. Crosswalks at major intersection should be constructed of a different material. In some areas, stamped asphalt coated with a tennis court surface appears like a brick inlay system.

Streetlights: As previously discussed, the master developer must decide early in the planning process to use standard electric company streetlights or purchase light standards with design appeal. Also the spacing between streetlights as well as the selection of low electricity-usage light fixture will affect the monthly cost of electricity.

Street trees: Located just inside the road right-of-way or within a 10-foot tree and utility easement outside of the right-of-way line. Spacing, tree species, and size of tree are design issues for street trees. In most municipalities, trees are located between 40 and 50 feet apart. Developers should strive for mature landscape material—3 to 3\(\frac{1}{2}\) -inch caliber trees. The landscape architect should select trees for variety, for floral display and scents, and for the canopy, whether deciduous or coniferous. Each road should have its own identity, and this should be reflected in the tree-species selection.

Building setbacks: In residential areas, building setbacks can be closer to the right-of-way line in neotraditional subdivisions. Or, in standard residential
projects, the front setback from adjacent houses could vary from 4 to 6 feet. Alternating the building setback will eliminate monochromatic streetscapes and lessen the impact of garages. Each street will provide different views of facades and roof lines, showing interest and architectural appeal. Design sells.

- **Sewer-line manhole**: Establishing a design criteria for sewer manhole locations within the right-of-way will improve the overall appearance of the streetscape. Many utility agencies will require that manholes be located along the centerline or crown of the roadway. This design approach will locate the sewer manholes out of the travelway. Conflicts with other utility lines will be minimized.

- **Fire hydrant locations**: Locating fire hydrants at intersections and spacing them at 500-foot intervals would be consistent with most utility department standards. Fire hydrants should be located at property line corners with the right-of-way line.

- **Views from road**: The horizontal alignment will provide differing view angles while traveling on the road. This can be accomplished with a curvilinear road design. Roads with centerline radii of 90 to 100 feet will provide design flexibility. It is also a traffic-calming design approach. The streetscape views will constantly vary with curving roadways. Reverse horizontal curves without a tangent between the curves will also have the same effect. For most large-scale master-planned communities, slowing traffic is an important tool in creating a residential scale community.

- **Three-way intersections**: To the extent possible, the land-use plan and core road system network should dictate intersection locations. Three-way intersection designs are preferred in most applications. Traffic flow and circulation can be better managed with properly planned intersection locations.

- **Traffic-calming designs**: Roundabouts designed throughout the community manage traffic movement and speed. The roundabout becomes a design feature and an effective traffic-calming device. The land inside the roundabout can be designed for passive recreational use, as a landscaped amenity, an entrance monumentation, or remain natural open space.

### 12.13 Summary

Advancements in infrastructure design have been in response to changing government regulations. The ability of engineers to provide value engineering must still be consistent with government regulations. For disjointed, residential subdivision projects, most projects are designed in accordance with local regulations with limited variances and design waivers. However, for large-scale projects, engineering-design programs can accompany the land-use plan application. Specific standards and criteria for the project would be used as a design guide. Master developers should seek creative engineering solutions to complement the vision of the project. Cost-effective, phased engineering design is essential to properly manage cash flow.
DISCUSSION TOPICS

1. Why should the master developer design and construct regional type storm-water management facilities serving all of the land-use pods?

2. Which infrastructure element can be influenced most by value engineering?

3. Which element of the infrastructure design is highly regulated?

4. Do traffic-calming devices and design alternatives achieve their intended goals?
Project Impact Studies

13.1 Introduction

Large-scale projects may have a significant impact on existing community infrastructure, public facilities, public services, and schools. In comparison, a traditional land-development approach of disjointed, single-family development patterns equaling the same number of units will also have the same impact. However, many jurisdictions assess each housing project on its own merits, and while a single project will not cause adverse impacts on their own accord, the impact of multiple disjointed, single-family subdivisions together would be comparable to that of a large-scale project.

The difference between the two approaches is obvious. Large-scale project are planned for sustainability, and the master developer is more willing to work with local government to diminish the impacts. The master developer also has the ability to spread the cost of any improvement over a variety of land uses and not just residential homes. A developer of well-conceptualized land-use plans is cognizant of the impact resulting from the project. All stakeholders with their vested interests will be more willing to work with a master developer to achieve a large-scale project plan beneficial to the existing community. This cannot be achieved by working with multiple residential subdivision builders. These projects generally are in compliance with local zoning and would be vested by right. In essence, if the builder did not ask for a zoning change, seek design waivers, or request variances, the project would be in compliance with the local ordinances. Also, the projects would most likely be developed on different timeframes.

Master developers should continually assess the impact of the project as the design program and land-use plan are being developed. The initial discussions with local government officials should include a debate on the expected impacts. The master developer must determine local community hot-button issues and retain professional
disciplines. The team should take a preliminary assessment of the community impacts to meetings with local officials.

As an example, if school overcrowding is a local hot-button issue, the master developer should assess how the project will negatively or positively affect the existing school system. The obvious negative impact results from a high concentration of housing units marketed to young families or move-up markets with children of middle- and high-school age. The number of children associated with residential housing units can easily be calculated and added to the existing school population. The impact will most likely be negative, even with school board—growth projections. Most school districts will use current zoning maps and development trends to project their school facility needs. The change in use for the large-scale project will undoubtedly cause a negative impact, but that impact may be offset by the master developer through negotiation. The solution may be as easy as dedicating and donating a tract of land within the large-scale project for the school districts' use. The purchase of land for expansion by the school district is always a significant cost issue. The master developer has the potential of resolving this issue through the land-use planning. The school district could then be able to focus their needs on the physical improvements.

As the initial planning is undertaken, the developer should organize his team of professionals assigned to determine the impacts resulting from an approved land-use plan. Typical impacts and studies required by government are outlined in this chapter. Each jurisdiction will have their own requirements and needs assessments, but the basic approach for each measurable impact is outlined.

### 13.2 Traffic Impact Study

Most municipalities require a traffic-impact analysis for staff review. The conclusions will help the political body and the developer to better understand the traffic generated from the proposed development and analyze ways in which to minimize the effect on the existing roadway system and its capacity. The traffic consultant will study the road circulation patterns and assess the level of service of each intersection adjacent to or near the project. This analysis will include a determination if each road element operates at safe and acceptable levels before and after build-out of the project. The traffic-impact study is prepared by an engineer with expertise and training in transportation and traffic analysis.

Typically, traffic-impact studies are required when the project consists of over 100 residential lots or if the project has a nonresidential use. Jurisdictions requiring traffic-impact studies will also have a process in which the report is submitted to the municipality for review and approval. A large-scale development should require an extensive traffic analysis consisting of fieldwork, computer analysis, and discussions between the traffic engineer, developer, and government staff members. In most municipalities, the Institute of Transportation Engineers Trip Generation Manual, 7th Edition, 2003 and the Institute of Transportation Engineers Transportation Impact Analysis for Site Development, 2003 are recognized as the publications to be used in preparing the traffic analysis.
Most existing road systems are public roads owned and maintained by either a local jurisdiction, county, or state government. There will be instances in which a large-scale project may border or have an impact on a federal highway and thus another reviewing agency and criteria will be imposed during the regulatory process. In some cases, the master developer may seek to have a new interstate highway interchange constructed to serve the project. This of course would add to the timeline, but the benefits of direct access to an interstate highway may outweigh the time it would take to obtain all permits and approvals.

In many states, road rights-of-way are owned and maintained by the state department of transportation (DOT), and this agency would review the traffic report for the project. The agency would approve the off-site road-improvement recommendations outlined in the report. If this is the case, the master developer should select a traffic engineering firm with excellent contacts and reputation with the state DOT.

A large-scale development will most likely require a well-planned collector-road system interconnecting to the existing road network (see Fig. 13.1). The traffic

Figure 13.1  Traffic, Traffic, Traffic. Traffic-impact study conclusions will affect the success of the project during rezoning. Large-scale projects may have an impact on the existing road system. Developers need to know the extent of the traffic impacts. With this information, developers will be able to make an informed go-or-no-go decision before entering the public spotlight.
distribution analysis of the existing road system, with the trip generated from the proposed project, will result in level of service changes. The master developer should ask for preliminary conclusions from the traffic engineer to establish a construction budget estimate for off-site roadway or intersection improvements. It is not uncommon for a large-scale project to require new traffic signals at intersections, construction of new turning lanes, additional new lanes for traffic flow and widening of existing roadways. How far and to what extent the improvements will be required is a direct result of the conclusions reached by the traffic engineer and discussions with local government officials. Since most large-scale projects are phased, the traffic report will use the proposed land-use and phasing plan as a guide in determining the traffic impact. Revisions to the master plan may also be caused by market changes over time, and the traffic analysis should be revised to address the land-use revisions.

It is important for a master developer to understand the basics of a traffic study and be able to review the report for pertinent and significant data. The professionals preparing the studies need to realize that their conclusions will be challenged by the master developer as well as by the municipality. Traffic engineers will also be questioned by the general public during the land-use planning process. In many cases, the general public will accept the conclusions of an expert. However, unfortunately, many citizens lobbying for growth control consider professionals retained by the developer as “hired guns” and the findings tainted by that relationship. Thus, it is incumbent upon the master developer to select a traffic engineer who has an established reputation in the community.

The traffic report should incorporate the project phasing and analyze the existing infrastructure at various stages of development. This approach would permit the master developer to phase in off-site improvements. This also benefits the project cash-flow demands. However, in return for this approach, it is conceivable that the regulatory agency may associate the improvements to a limited number of residential units or nonresidential construction. Thus the completion of specific off-site road improvements may have to be completed before the next phase is permitted for construction. If needed, the master developer can always expedite the offsite improvements to accelerate the next phase of the project, if needed.

The methodology taken in preparing a traffic report does not generally vary. The master developer can use the basic tools to understand traffic-engineering concepts. Most traffic-impact reports will include illustrations of the existing road system before and after the project build-out. The essential components of the traffic analysis report are listed and explained as follows:

**Project Introduction**

- Includes an overall plan showing the existing land uses and zoning in the vicinity of the proposed project. This plan should extend out at least to the major arterial road system. This plan would show the existing road system and identify the roads by classification, i.e., collector, rural residential, etc.
Includes an overall plan showing the proposed land uses for the proposed large-scale project and the core road system alignments.

Should include a plan showing the master plan of the municipality, identifying proposed roadways including capital improvement projects. New roads planned by a municipality are generally illustrated by several alternative alignments on a master plan. If one of these proposed roads is near or crosses the project site, the master developer should consider this to be a regulatory hurdle and consider this a community hot-button issue. Since the developer is seeking regulatory approval of a large-scale land-use master plan, the municipality will use the forum to promote the construction of the proposed road by the developer. The land-use plan for the project may also need to incorporate a future road right of way into the plan.

Includes a plan showing the phasing of the project and providing an estimated timetable for construction sequencing.

Should illustrate the existing and proposed right of way and pavement widths for each existing and proposed roads.

**Existing Conditions Analysis**

Prepare a plan showing the existing travel-lane widths, ROW (road right-of-way), and indicate the pavement condition of each road and indicate existing curb or roadside ditch. Include a narrative on the existing utilities located within the ROW.

Traffic counts on existing roadways should be from recent data. Certainly with the development patterns of most areas, the traffic counts should be started when the field boundary and topography surveys are undertaken. This would ensure the field data is recent. The traffic data should include daily and peak-hour traffic volumes for each roadway. The field data should also include turning-movement data at existing intersections.

The traffic engineer should also prepare a narrative on the condition of each existing road in terms of horizontal and vertical alignments, sight-distance problems, drainage facilities, signage, utilities, and any other impediments, i.e., houses too close to the right of way line, fences, telephone pole locations, etc.

The report should include a capacity analysis and level of service determination of existing critical points and roads surrounding the proposed project.

**Future Conditions without the Proposed Development Analysis**

This portion of the report will analyze the existing roadway system for the build-out period of the proposed project. This analysis will include traffic projections for the area and include capital improvement projects expected to be constructed during the proposed project build-out period. Also in the
study area, there will be other housing and nonresidential planned projects generating traffic, and these future conditions should be incorporated into the analysis. This analysis will provide a benchmark in which the existing infrastructure can be assessed based on future demands generated from growth not associated with the proposed project. The projections should include daily and peak-hour traffic volumes. The capacity and level of service analysis will again be determined for the existing roads and critical intersections.

**Trip Generation Data**

- The Institute of Transportation Engineers (ITE) publishes trip-generation data for various land uses. This manual provides the most recent data and establishes an industry standard in which to predict the number of vehicle trips based upon proposed land use. This data is used to determine the weekday, morning, and evening peak-hour vehicle trips. Vehicle trips are calculated by multiplying the rates obtained from the ITE manual by the appropriate number of units or the nonresidential project size. As an example, a sustainable development should include mixed uses to encourage live-work connectivity, but this may skew the on-site traffic flow and destination points. Thus the traffic engineer will adjust the total number of vehicle trips based upon the overall land-use plan proposed for the project.

**Trip Distribution**

- This portion of the report shows the trip distribution of traffic to and from the site once the project is at full build-out. This includes showing the number of vehicle trips and their directional movement at intersections and on existing roadways. The traffic engineer will use industry standard approaches to show the direction in which the traffic flow will be generated based upon the proposed land-use plan at ultimate build-out. The master developer should review the report to review how the vehicle trips are distributed on the existing and proposed roadways. This analysis provides a level of traffic flow, highlighting which roads will receive the bulk of the trips and which may require further governmental review and analysis. It is possible that a revised land-use plan and interior-road layout may alter the vehicle-trip distribution and thus change the conclusions of the report and extent of off-site improvements.

**Turning Movements**

- Turning movements will be for the proposed core roadway system, ingress-egress points, surrounding intersections, and roadways. The evening rush hour trip generation will typically be used in assigning the vehicle
movements. This information is typically illustrated by a plan showing the
vehicle movements at project entrances and surrounding intersections labeled
with peak-hour vehicle volumes.

Future Conditions Analysis

- The future traffic volumes generated from the proposed project at ultimate
  build-out is combined with the traffic calculated from the future area
  conditions, not including the proposed project. The existing roadway and
  intersection will use this information for capacity and levels of service analysis.
  Traffic engineers will analyze this data and determine the adequacy of the
  existing roadways, existing intersections, and planned capital improvement
  projects based on the future background data plus the traffic generated from
  the proposed project at full development.

Summary and Recommendations

- The traffic-impact study should include a summary of peak-hour traffic
  volumes. The report will also include a capacity and level of service analysis of
  the existing roads and intersections. The report will contain a list of proposed
  improvements to the existing road network and intersections to ensure a
  minimum level of service is maintained at full development. The summary
  should address right of way dedication requirements, road-surface
  improvements, road widening or alignment changes, intersection or
  entrance-road improvements, and changes to the traffic-control signage
  surrounding the project.

- The traffic-impact analysis may extend beyond the data reporting, analysis, and
  recommendations to include other methodologies to reduce peak-hour trips
  and traffic volumes. This may include proposing mixed-use land-uses
  incorporating flextime programs, car pooling, mass transit options, and
  pedestrian connectivity plans. Concepts will be investigated to revise the
  overall land-use plan to disperse uses differently on the site and select an
  alternative entrance to the existing road network, resulting in less impact on
  the existing infrastructure.

13.3 Growth Impact Study

Municipalities experiencing an increase in development pressures react to the demand
on their community services. This reaction is typical, since most municipalities govern
for the present and plan for the future but rarely guide the present into the future
with foresight. Municipalities generally wait for future community needs to be
financed by the land-development industry rather than proactively expand services
in areas where growth patterns should be promoted. Local governments should start the process of determining where development patterns should be directed and not wait for an application and then debate how services will be provided. The notion that all of the “good land is gone” is correct if only economic factors are considered in development. The traditional disjointed subdivision approach needs to fold into large-scale master-planned community approaches, seeking consensus among all stakeholders in the community. This would entail having a local community plan illustrating how they want their available land to be developed. They should create a village concept that incorporates isolated subdivision projects into a larger master-planned area. In this instance, they essentially become the master developer, guiding land uses and development patterns. This is representative of a community seeking to control development patterns for sustainability. The community should factor in economic, social, and environmental concerns in creating the village-development pattern. Large-scale projects spur surrounding developments. These isolated projects utilize the sustainability of the large-scale project but are not incorporated into the large-scale project unless local government develop master plans for villages, incorporating large-scale project land-use planning concepts and criteria.

In the absence of a local community proactively guiding development patterns, the master developer may be required to analyze the causes and effects of the growth impact on the community. This may be required by local government as a preamble to the submission of a land-use plan and rezoning application for a proposed large-scale project. A growth-impact study would include site-analysis conclusions on: site soils, topography, slopes, wetlands, floodplains, existing vegetation, existing road network, utility availability, and water- and sewer-line locations. The impact study would include an in-depth analysis of the existing infrastructure and future planning by the municipality. An assessment would be summarized on the large-scale project’s consistency with community goals and objectives. This assessment may do the following:

- Review and determine the consistency of the large-scale project with the growth-management plans of the community.
- Analyze and determine the effect the large-scale project will have on defined community goals by reviewing community master plans and comprehensive plans.
- Review adjacent municipality growth-management plans and master plans. The report would include an assessment of the anticipated impact on adjacent communities.
- Review the land use and zoning maps to ensure the adjacent uses are consistent with the overall goals of the large-scale project and consistent with the intent of the community in controlling their development patterns.
- Review public facilities master plans, especially in adjacent communities. Most communities will have master plans for future water and sewer trunk-line extensions and expansion goals for water availability and sewer treatment–plant capacity. In many cases, a large-scale project will have significant demands on
existing public facilities requiring either upgrading or extending facilities to serve the proposed project. Adjacent vacant properties should also be included in the analysis since large-scale projects attract disjointed development patterns.

- Review existing road capacities and municipal efforts to deal with traffic congestion. Existing roads in most municipalities are insufficient to handle the traffic needs of the community even without considerations for future growth. This is a result of local government’s failure to properly plan for growth and its attempt to shift the financial burden to new developments. This leads to patchwork road improvements, which may result in even worse traffic congestion and adversely impact citizens. This negatively affects their impression of development and growth pressures. Without transportation relief for existing conditions, citizens overreact by demanding that development stop or, at least, slow down. Growth and development will continue to occur and local government must provide proper community growth planning.

- Review capacities of other utilities and their expansion plans. Growth will also have an impact on the capacity of other utilities and the ability to expand or extend those services to the large-scale project. Electric, telephone, natural gas, and cable services are at times taken for granted. This is the case, in general since these utilities seem to be able to handle growth pressures. Master developers may still be required to provide intent to serve letters from each utility company. This will give a level of assurances to the municipality that the utility companies are able to service the development patterns outlined in the growth-impact study.

13.4 Population Impact Study

The land-use plan provides a framework in which to prepare the population-impact study (Fig. 13.2). The delineation of the specific residential uses will define the expected total number of adults and children. As stated previously, an active-adult community increases the population, but the impact on government services will be less than other market segments. Population increases in many locations is a result of net population growth. This growth causes the land-development industry to provide housing options in many markets. The population impact study will assess the effects the large-scale project will have on community-growth projections. The growth impacts are key political issues elevated to public debate. New housing projects, expanded government services, and stress on existing infrastructure are direct results of net migration.

Many local governments and chambers of commerce actively market their community as a destination best suited to raise a family, for employment, and to enjoy the activities offered. This will encourage housing developments while some communities position their political views on the other end of the spectrum. A no-growth attitude and an unfriendly environment for business development will establish a long-standing stigma; many land developers will avoid consideration of such environments for their
development plans. However, progressive communities market the advantages of their town and are willing to accept the increased social concerns resulting from an increase in net population. This study will assess the advantages and disadvantages of an approved large-scale development on community elements impacted by an increase in population. The market study, combined with the population assessment, will provide a basis in which local politicians will approve a large-scale development for its sustainability.

13.5 School Impact Study

Many municipalities have debated the advantages of new projects and assessed their impact on the existing school system. As a result of this consideration, the municipality seeks new homeowners to bear the cost of expanding schools by implementing a school impact-fee ordinance. This impact fee is typically charged against only new homes. Based upon the housing type constructed, the impact fee may vary due to the number of bedrooms, or the fee will be assessed per housing unit. Each
municipality may have its own formula in calculating the number of school-age children expected from proposed housing projects. This approach is typically assessed against the traditional, disjointed housing subdivisions proposed in compliance with the land use and zoning ordinances. However, for large-scale development projects, the same analysis should not be applied, simply because the master-planned project will incorporate nonresidential uses contributing to the local tax base, and the project will be phased over a long build-out period. Also, many purchasers will be from the existing municipal population. Also, the master developer may include a school site within the project as a means in which to assist the school district in expanding their facilities.

The land-use plan proposed for the large-scale project will include various residential projects that may contribute children to the school system (see Fig. 13.3). The projected school population should be assessed for each housing pod. The school-age projection should be added to the current school population by grades to determine the current classroom capacity. The analysis is intended to determine if the future school-age population can be accommodated with existing facilities. Most

Figure 13.3 School Population. School facility planning is reactionary rather than proactive. Developers should meet with school board officials early on to ascertain the impact a large-scale project will have on the community school system.
school districts will also have a future facility-expansion program. This program will have a projected improvement schedule irrespective of the large-scale project status. Information concerning the current school enrollment by grade and the future plans of the school district needs to be obtained to adequately determine the impact. Phasing of the master-planned project may correspond with the future expansion anticipated by the school district. If there is a need for new classroom capacity, the municipality has the forum in which to discuss the ramifications of the large-scale project on the school system.

For the rezoning application, the municipality will require the master developer to prepare a school-impact analysis for review. This report would be required with the submission of the land-use plan. To comply, the master developer should fully understand the product selections for each housing area and the timeframe in which each project will be constructed. The report would include an estimate of school-age children associated with each dwelling unit type within each housing area. The local school district will have defined multipliers for each type of housing unit as a method to calculate the number of school-age children.

In some states, the cost to a municipality for operating schools is based on local property taxes and not on a per student basis. Typically, new developments and specifically housing projects within a master-planned community would increase the tax base by having higher property values. This is complemented by adding commercial and mixed-use components in the master-planned community. The tax revenue generated from the nonresidential uses probably pays for any school facility expansion necessitated by the residential component of the project.

13.6 Public Facility Impact Study

Most communities will have master plans for future water and sewer trunk-line extensions. They also have expansion goals for water availability and sewer-treatment plant capacity. A large-scale project will have significant demands on public facilities either for upgrading or extending facilities to serve the proposed project. Adjacent properties not included within the large-scale project will also be developed and need to be considered in the public-facility analysis.

The existing water system should be analyzed for improvements that will provide and ensure adequate fire flow and pressure. Also, current water-storage system facilities should be evaluated for adequacy to handle the increased demands.

Sewer line capacity, lift station sizing, and wastewater-treatment-plant capacity should be assessed for current operations and how it will meet the needs of future development. This analysis would be based on the current community land-use and zoning plans.

Existing roads in most municipalities are insufficient to accommodate the traffic needs of the community, even without consideration of future growth. This is a result of local government’s failure to properly plan for growth and attempt to shift the financial burden to new developments. This leads to patchwork road improvements,
which may result in even worse traffic congestion and adversely impact citizens, furthering their impression of stopping or slowing-down growth as a solution.

Growth will also have an impact on the capacity of other utilities. Each utility company must assess their ability to expand or extend their services to the large-scale project. Electric, telephone, natural gas, and cable services are at times taken for granted since these utilities seem to be able to handle growth pressures. Master developers may still be required to provide a letter of intent to serve from each utility company. This will provide assurances that the utility companies will be able to service the development patterns of the area.

**13.7 Fiscal Impact Study**

Although many communities require the developer to submit a fiscal-impact study, the data and information needed for an unbiased accounting are government generated. Thus, upon the submission of a land-use-plan application, local government may consider preparing an analysis of the cost and revenue impacts on government entities if the large-scale master plan was approved. A well-planned and well-conceptualized mixed-use development managed and operated by community associations will enhance property values. Revenues projected over time should exceed the cost of services provided to the project.

The characteristics of the land-use plan should also be analyzed against current development patterns. It is not just an analysis of the project and its impact on government but a determination of the alternative development patterns if the large-scale project was not built. After all, most disjointed development approaches are stand-alone residential subdivisions seldom analyzed for fiscal impacts. However, multiple subdivisions will have a greater impact on a community than a well-planned large-scale project.

Since municipalities have to provide the data, they are best suited to prepare the fiscal-impact study. Master developers should become familiar with the information used in preparing the fiscal analysis. The typical approach would include a summary of the proposed large-scale project land uses in terms of unit counts, type of residential units, and size of nonresidential uses. Employment projections and property values are considered. And, of course, the revenue and expenditures of the municipality are analyzed due to the changes associated with the proposed land uses. In most jurisdictions, a large-scale project is reviewed much differently than typical hopscotch housing projects. The master developer provides a better overall development approach and will contribute to existing infrastructure improvements as a condition of approvals. This contribution may be in the form of an impact fee or a requirement to construct improvements. This should also be included in the fiscal impact analysis.

Local government will be concerned about the cost of services resulting from the proposed project approval. The impact study will review the budget and specific department budgets beyond the general government expenditures. Typical department considerations may include: police, fire, public works, building, code enforcement, health services, and recreation facilities. The developer should become
knowledgeable about the local budget and the budget allocations per department. This will provide the background data in which the developer may agree or debate the conclusions of the impact study.

### 13.8 Historical, Archeological, and Cultural Impact Study

Existing communities strive to preserve their historic buildings and landmarks through the implementation of an ordinance. This ordinance will require literature and field research to assess the historical, archeological, and cultural significance of the site. The literature research should be supplemented by visiting the local historical society or state commission on historical and cultural preservation. Large-scale projects encompass a large area of land and may include multiple properties. All of these properties and adjacent properties should be researched to determine the presence or absence of historic features. This impact study needs to be prepared early in the planning stages, since the ramifications to the land-use plan and overall land plan could be significant, especially if any areas require protection or preservation. The area of historical significance may require isolating the area of concern. This will effectively reduce the area suitable for development purposes. The study will include literature research to determine any historical patterns within the areas. Archaeological observations and testing must also be required. This approach is an extensive investigation of the property characteristics including analysis of soil types, vegetation, and drainage patterns.

Municipalities may establish a historical commission that will review impact studies. The commission will establish guidelines to determine the property’s historical significance. Any changes to the property with existing historical features will also be reviewed and approved by the commission. The master developer should discuss the issues of historical significance with the property seller during the due-diligence period.

### 13.9 Environmental Impact Study

Most if not all property is affected by environmental concerns or constraints. These issues are elevated in importance by local, regional, and federal regulatory oversight. The general public is intimately aware of development pressures in their community. They have also formulated opinions on how development affects the environment. Master developers are also keenly aware of how environmental concerns may affect lot yield and project costs. This level of scrutiny by all vested interest groups is the basis for government requiring environmental impact studies. Most communities are now requiring environmental analysis on most nonresidential projects and the majority of stand-alone subdivision projects.

For the large-scale project, the master developer should undertake an environmental impact study (EIS) of the site during the due-diligence period, even if the study is not required as part of the rezoning process. This study is important in preparing the land-use plan and core infrastructure elements. Environmentally conscious
development has been termed “green development.” This approach is not new but branded for marketing purposes. Large-scale projects have typically been environmentally sound, since sustainability of the project is more important than maximizing uses or dwelling units, which is typically not the case of disjointed development patterns.

Environmental impact studies can be comprehensive in scope, addressing multiple concerns affected directly or indirectly by the proposed development. This analysis should first and foremost evaluate how the land-use plan and core infrastructure will preserve, protect, and enhance the environment of the property in question, adjacent properties, and noncontiguous land. The master developer should select an environmental consultant with experience in preparing EIS. The firm selected should have the expertise to address a wide range of environmental issues. And it is always advisable to retain the services of a local environmental consultant who knows the community arena and local land characteristics. Environmental permitting and approvals may extend beyond the local level. However, working with state environmental departments or the U.S. Army Corps of Engineers is a more defined effort and may not be as emotional as the local process.

The report should have a detailed description of the proposed land-use plan and project-design concepts. A suggested outline for this portion of the report might:

- Describe the proposed site by listing parcel identification, frontage roads, owners and/or applicants, project acreage, and stream or watershed names.
- Provide a copy of the land-use plan in the report.
- Describe the proposed housing element by delineating the parcels allocated for various residential densities. This chart or description should include a total number of units for the project. This approach should be repeated for the proposed nonresidential uses.
- Describe the transportation and road network system planned for the core infrastructure. Also, delineate the road standards to be used for each individual project.
- Describe the utility services plan proposed for the project. This would include water and sewer availability for connection to and servicing of the project.
- Describe where in proximity public facilities are located for providing service to the project, i.e., fire protection, police, and emergency medical services.
- Describe the recreation and open-space components of the land use plan.
- Prepare a construction sequencing plan outlining the anticipated phasing of the project.
- Describe the operation and maintenance entity established for the overall proposed project and management approach for each individual land use pod.

In many jurisdictions, the environmental analysis is limited to the presence or absence of wetlands and/or floodplains on the project site. As stated before, this information is important to the developer in ascertaining the total upland area suitable for development. The environmental impact analysis goes beyond
wetlands and floodplains. It would not be uncommon in an environmentally conscious atmosphere for local government to require the following to be addressed in the analysis:

- Discuss the consistency of the proposed land-use plan on existing local, regional, state, and federal environmental regulations. Discuss how the project will be in compliance or noncompliance with current regulations.
- Discuss if the proposed project will alter or impact any existing environmentally sensitive areas on site or on adjacent properties.
- Discuss the effects of the proposed project on groundwater quality and quantity.
- Discuss how the project is in compliance or noncompliance with current clean-air regulations imposed on land-development activities.
- Discuss the effect the large-scale project will have on existing wildlife habitat. Provide mitigation measures as necessary.
- Discuss the design approach for soil erosion and sedimentation control during construction activities. This section would include a discussion on dust from construction operations.
- Discussion on the storm-drainage design, storm-water management facilities and best management practices approaches for the project.
- Discussion on the noise levels during construction and estimated for the area after build-out occurs.
- Discuss the proposed methods for solid-waste disposal from each proposed residential and nonresidential areas within the project.
- The phase one and phase two study summaries should be included in the EIS.
- Describe the existing vegetation and the measures to be taken during construction to retain as much existing vegetation as possible.
- Discuss if there are any endangered species located on or near the property that may have buffers or no-build areas impacting the project site.
- Discuss existing or proposed rights-of-way or easements that may impact the site.
- Discuss the adverse environmental impacts of the project that cannot be avoided.
- Discuss what the short-term and long-term environmental effects of the proposed project.

Many municipalities have expanded the environmental impact study to include an analysis of alternative approaches and environmental consequences of the proposed project due to the following options: (a) no action, (b) postponing the proposed project, (c) relocating the proposed project, and (d) implementing the proposed project.
Government may continue to expand this study to include an analysis of sustainability, green-building practices, and value-engineering practices.

13.10 Recreation and Park Facility Impact Study

A large-scale project will also impact community owned and operated recreation areas and park facilities. However, most large-scale multiuse projects are designed with their own recreation and park areas. Recreational uses, passive and active, and park areas are important project-design components for marketability, establishing a community lifestyle, a sense of identity, and sustainability of the project (see Fig. 13.4). Most communities have ordinances in place governing the amount of open space to be set aside in the project. The use of the common open space may also be dictated in the ordinance. If the amenities are designed for the entire large-scale project, the impact on municipal facilities may be insignificant. However, the master developer needs to assess this impact so that specific questions may be answered based on

Figure 13.4 Community Services. The impact of a large-scale project on community services and departments may be significant. Developers seeking an open dialogue with administrative officials at the initial planning stages would be advantaged by addressing issues in the project-design program.
the knowledge and extent of existing facilities. In many instances, the large-scale project will include recreational uses and areas suitable for the market. In other instances, the community may seek a parcel of land allocated in the land-use plan for public use. Recreational uses, parks, and open-space areas are common hot-button issues.

The master developer should concentrate on fitness and recreation needs for youth, seniors, and families. This approach would be to supplement current public facilities but not compete with private providers. A multipurpose building facility may also be considered if the municipality does not have an existing community center. A public golf course may also be a consideration, based on its location and need. The impact study would include all general public facilities used for recreation and list the parks in the community.

Determine the use, availability to the community, and capacity of recreational areas, parks, and open spaces. There may be multiple recreation areas within the municipality, and the location of the large-scale project may or may not impact all of those public facilities. The selection of the recreational and park uses and areas within the proposed project should be made with full understanding of existing community needs. The master developer should also be cognizant of the connectivity of the proposed project with existing community facilities. This may include a pedestrian-pathway system or bike trails that extend to existing facilities. The linkage between existing and proposed facilities is an important planning tool considered at the inception of the project.

**13.11 Summary**

The impact large-scale projects may have on existing communities and its environs can be properly managed through the preparation of specific impact studies. These studies are disseminated for review and discussion. Typically, the impacts are mitigated by developers during the planning process. The ability of a master developer to properly utilize the attributes of the land for development purposes will materially alter the scrutiny by the general public and government agencies. Although not all of the impact studies are required locally, the developer should consider having the majority of these studies prepared even if only for internal use. The cost of preparing these studies is insignificant in comparison to the information obtained for preparing and discussing the land-use plan with the multiple interest groups and regulatory agencies. The information from these studies provides an excellent resource for community discussions and for use by the design team in incorporating ways in which to lessen the project impact. There will be impacts from a large-scale project, but the alternatives in developing the property in question may be unacceptable to both the developer and community.


DISCUSSION TOPICS

1. Would it be in the best interests of the master developer to have impact studies prepared regardless of the requirements of local government?
2. If there are defined off-site improvements, is it better for the master developer to pay local government to complete the work or complete the design and build the improvement as the project progresses in construction?
3. For each impact study, list the positive impacts that might be associated with the development of a large-scale project.
4. In terms of impacts on a community, which affects the community more, a large-scale master plan or a hopscotch development pattern?
14.1 Introduction

Large-scale projects that have multiple land uses platted into separate project parcels should have operation and management entities established for each project to sustain property values and community image. The master developer should also establish design programs and architectural themes to be enforced throughout the project. The intent of this architectural control is to provide design consistency, standard appearances, and a sense of community among the individual projects. All of which contribute to the overall community appearance and image. To accomplish this, the master developer should establish an overall community association that would encompass all land-use parcels, common amenities, and open-space property. Each individual project would have separate and distinct homeowner associations, covenants, restrictions, and architectural guidelines intended to run with the land regardless of ownership. Covenants and restrictions are imposed by the master developer addressing many elements of community living that are not addressed in government ordinances or regulatory oversight. The covenant and restrictions are intended to protect the value of the property within the entire community.

An overall community association would be the umbrella organization overseeing the operation and maintenance of common-area facilities. This umbrella organization would also have oversight responsibilities to ensure individual homeowner associations are functioning in the best interest of the entire community. For large-scale developments, the master developer will supplement the community association financially and manage the association until the project nears completion. The master developer should retain control of the community association to ensure the overall vision for
the project is followed and to ensure each association is properly managed and rules or regulations enforced appropriately.

During a lengthy project build-out period, the aesthetic appearance and quality of the community must be sustained for its marketability and to enhance property values for the long term. Thus, homeowners purchasing a home in a master-planned, large-scale project must belong to the homeowners association governing their place of residence but also to the umbrella community association. Thus, the homeowner would have two association fees to pay on a yearly basis. The membership is mandatory for all property owners within the large-scale project.

In most states, the association documents must be prepared and registered with the state consumer affairs department. Local jurisdictions may also require the association documents to be submitted for approval as a condition of the land-use plan application. It is in the best interest of the developer to retain the services of real estate attorney with expertise in preparing community, homeowner, or condominium association documents. Each association is a separate legal entity with the association documents outlining the responsibilities of the members and the board members elected to govern that association. The rules, regulations, covenants, and restrictions of each association are enforced legally by the board of directors as outlined in the bylaws of the association. As each land-use area is constructed by an outside builder-developer, the master developer should ensure their association is properly structured and implemented. The developer should also be involved in the builder turnover process in which the management control of each association is transferred to the homeowners. Consideration should be given to establishing an association governing the nonresidential areas within the community. As land-planning techniques change and the interconnection between residential and nonresidential areas are of greater importance, the need to expand control over all land uses within the large-scale project will increase.

As land-development design practices change, consistent with regulations, the association documents and deed restrictions must change with the design approach. As an example, engineers and developers are incorporating best management practices techniques in the community design. As local jurisdictions concentrate on community wide issues, the association documents must include measures to ensure specific design elements are properly maintained and operated in accordance with the design of the project. Best management practices can be designed in various forms requiring special maintenance and operation programs to ensure properly functioning systems.

Covenants and restrictions must also address new site-design characteristics imposed by government. Best management practices include preventative and control measures implemented to reduce or eliminate the contamination from site generated storm-water runoff. The operation and maintenance of the control facilities must be adequately addressed in the association documents. Many best management practices approaches must be deed restricted to assure the integrity of the system. An example of a water-quality control measure is a rain garden installed on individual homeowner lots. These facilities can be relatively small and appear to be landscaped
areas with special plantings. However, the engineered filter layers and underdrain system must function and operate properly to meet the intent of its design. Rain garden areas would be incorporated in a drainage easement and restricted from any homeowner alteration. The operation and maintenance of these types of facilities would be the responsibility of the association rather than individual property owners.

A master developer should consider the methods in which the integrity of the community is maintained for years to come. As government regulations change, developers must revise community and homeowner documents to ensure the integrity of the community infrastructure elements. Common elements of a large-scale project, under the responsibility of the umbrella community association, may include the following:

- Private roadways; pavement, curb, sidewalks
- Drainage systems; inlets, pipes, head walls
- Storm-water management facilities; retention or detention basins, rip rap
- Best management practices; rain gardens, infiltration devices, swales
- Wetland areas
- Streetlights
- Common-area open space; lawn maintenance; plantings
- Street trees and landscaping
- Recreation facility: clubhouse, welcome center, pool, tennis courts
- Urban parks and pedestrian pathways; equipment, pavement surface of pathway
- Entry features: specialty pavement surface, pond fountains, guardhouse, gates
- Buffers and conservation areas
- Easements for utilities
- Signage, monuments

The common-area elements that may be operated and managed by the community association will parallel the vision of the community upon build-out. The essence of marketing a large-scale project pivots around the ability to control the overall appearance of the community for many years. Not only are well structured association documents necessary, but developing practical and definitive covenants and restrictions for the various land uses is tantamount to a successful project.

Many restrictive covenants are imposed during the land-use plan approval process, which may include building setbacks for each land-use area. The intent of having covenants and restrictions is to govern activities within the community and enforce a more standard appearance within each separate land-use area. The master developer with assistance from architects, landscape architects, and engineers should establish each land-use pod with design integrity, practical usage of materials, and a color pallet sensitive to the overall community vision—all of which can stand the test of time.
14.2 Builder Programs

Each residential land use should have its own covenants and restrictions to preserve the character of the community and protect the value of the homes within each project. The covenants and restrictions shall run with the land. The master developer should create the framework for each project in which the covenant and restrictions will be based. This framework or guideline would be standard regardless of the housing product intended for each land-use area. The master developer should concentrate on the streetscape or street scene for each residential project. Thus by establishing a development and architectural pattern specific to each residential area, the overall community appearance and value will be retained and enhanced.

Although there are differences in housing product, the single-family detached product would have its own criteria separate from the higher-density residential uses. The developer should decide on the design program approach within each residential land use to ensure market differentiation while maintaining design consistency throughout the community. Restrictions included in the documents may include addressing the following design elements:

- Living area minimum square footage per minimum number of bedrooms
- Varying front-yard setbacks between adjacent units
- Restricting front elevation look-alike between and across from each unit
- Two-car or three-car garages: detached or attached
- Front- or side-loaded garages
- One- or two-story houses
- Concrete, asphalt, or pavers for driveways
- Location of air-conditioning (AC) units
- Street trees and front-yard landscaping
- Fencing location and style
- Architectural fenestration and window style
- Architectural style; i.e., colonial, cottage, country, or Tudor
- Material usage for siding, roof shingle, garage doors, and front door
- Color pallet for siding, roof, front door, exterior trim
- Mailboxes
- Street lights
- Entry features
- Outline prohibitive uses
- Animals
- Antennas and satellite dishes
- Clotheslines
- Signs
14.2 Builder Programs

Trash containers and collection
Vehicle parking
Window treatments
Play equipment

Higher-density residential land uses would require additional covenants and restrictions for the site elements. This approach would remain valid for the amenity building and associated recreational elements included in each project. Additional elements of the site design should also be addressed:

Gang mailbox location, style, material
Pathway system
Site furniture, e.g., benches, gazebo
Site lighting
Parking-lot wheel stops
Entry features, directories, and signage
Solid waste and recycling stations
Common-area landscaping, irrigation, and lighting

Sustaining quality projects constructed within a large-scale project is essential to the marketability of the community from one year to the next. Master developers should select builders of each land-use pod based upon their past successes. The reputation of each individual builder selected should be impeccable and without reproach. Their industry reputation is marketable and relieves some pressure from the master developer. The developer can rely heavily on a reputable builder to design, sell, and build a quality project. This would allow the master developer to concentrate on the finer details of the project.

The land-use plan outlines the phasing of the various land uses and establishes an absorption-rate program. This in return will narrow the list of available builder-developers for each land-use pod. In most cases, the master developer should be selecting builder-developers for each area, because they will be developing the property and constructing homes for sale. If the land is conveyed to a pure developer, which subsequently sells pads or homesites to separate building entities, the master developer will lose control over the product designs, since the individual builders in this instance would have contract obligations only to the developer of that specific land-use area. The master developer should incorporate language in the property-purchase contract stating the master developer must approve all architectural designs within the community.

The master developer should consider local builder-developers with reputations for high-quality projects. They will have a local following and will be able to market their project within the large-scale project almost by word of mouth. The master developer should consider national builders having regional operations in the area. In some instances, the national builder may not be suitable for the project, because
their product line is inconsistent with the vision for the project. However, the master developer should consider a national builder for the first phase of construction. These builders have the cash flow, marketing, and operational support to proceed with a project in a short-period of time—especially if the land-use entitlement corresponds with their housing expertise.

Thus the land plan should also consider the end-user or purchaser of each land-use pod. Creating land uses suitable to their operations and product line will be a marketing plus. Covenants and restrictions created for the project should not be compromised to accommodate the nuances of a national builder. The controls complementing the land-use plan and the project vision will create an atmosphere of local and national builder-developers wanting to be a part of the community.

### 14.3 Nonresidential Use Programs

A master plan will have various nonresidential uses planned within the project. These nonresidential uses will have a more significant impact on the home-buying public than the marketing of each residential project. The goal is to create a destination place for people to live, work, and have a sense of community. The most visible and core land uses are typically nonresidential. These elements of the design would be town centers, new urbanism designs, community amenities, or a mixed-use projects.

Regardless of the type of nonresidential use or its location within the project, the developer must prepare covenant and restrictions empowering the master developer to enhance the marketability of the community and enhance the property values by controlling the aesthetic appearance and architectural design of each nonresidential use. In every instance, there is a balance between design, function, and cost. The ideal formula is to have practical interior-building design layouts that relate to adjacent buildings. Functioning buildings will be well received by the specific users and general public. The proportionate share of the construction cost should be allocated to the exterior architectural presentation of the building—e.g., materials, form, color—which should correspond to the overall architectural theme of the project.

The covenants and restrictions of nonresidential buildings will not only address the exterior architectural component of the building but also establish permitted uses. The permitted uses may be more restrictive than the zoning districts established by local government. The importance of controlling the uses is simply to protect the value of the nonresidential buildings and the adjacent users from unwanted or detrimental uses. Also, control should be exercised over the site-plan layout of the nonresidential use. As an example, the master developer should review the site plan and control:

- location of the parking lot, traffic circulation
- location of pedestrian access, sidewalks
- landscaping of parking areas, islands, and buffers
- parking lot island locations
14.5 Definitions

- directional site signage
- identification signage for users
- dumpster locations, recycling centers, design of enclosures
- heating and cooling equipment locations
- service entrances, loading and unloading areas
- restricting the time for truck deliveries
- site furniture locations and style: e.g., benches
- site-lighting fixture style and locations

In essence, the master developer’s goal is to protect the value of the property through controlling the aesthetic appearance of the residential and nonresidential uses. Reviewing the site plan and offering comments and concerns may be done by the developer’s engineer. This review process would precede the individual site-plan application.

14.4 Homeowner Value Assessments

A community association will be the umbrella organization managing and operating the common areas within the entire community. The cost of operating and maintaining common-area improvements should be evenly distributed over the residential units and nonresidential uses. For the residential component, the type of unit, estate house, or duplex unit would not be treated differently for the per unit assessment. The assessment would not differentiate between unit types or ownership. This fact should be conveyed to the various builders of the land-use pods within the community.

14.5 Definitions

The community association documents will typically have a definitions section to ensure certain words or terms have specific meanings. Since attorneys are best suited to prepare the documents and their definitions would supersede the following terms, below are some typical terms found in a declaration of covenants and restrictions:

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Affiliate</td>
<td>shall mean any legal entity under common control, controlled by, or controls the sponsor. Basically, if the master developer has a partner in the project, the documents would need to reflect the management and ownership arrangement.</td>
</tr>
<tr>
<td>Assessment</td>
<td>shall mean the amount levied against each member necessary to cover the annual expenses of the association.</td>
</tr>
</tbody>
</table>
Association: shall mean the legal entity set up by the master developer and is typically a nonprofit organization, its successors and assigns. In the instance of a large-scale project, this would be the umbrella community association.

Board: shall mean the Board of Directors or Board of Trustees of the association referenced in the Certificate of Incorporation, bylaws, rules, and regulations defining any power, duty, right of approval, or any other right of the Association referencing the Board and not the members of the Association. The Board shall have the power to make rules and regulations as deemed necessary to carry out the intent of the covenant and restrictions.

Bylaws: shall mean the regulations governing the affairs and actions of the community association. These bylaws would typically have a provision outlining the turnover process in which the association affairs are transferred from the master developer to the Community Association Board of Directors.

Declaration: shall mean theDeclaration of Covenants, Restrictions, and Easements document prepared for the community association.

Lot: shall mean any individual building, residential lot, or unit located within any portion of the project property. This would need to be expanded to include nonresidential uses.

Member: shall mean and refer to all of the lot, building, or unit owners within the project who are members of the association, including the sponsor.

Owner: shall mean the record owner of the building, residential lot, or unit located within the project.

Property: shall mean the project boundaries typically described by a boundary survey or metes and bounds legal description defining the confines of the community.

Regulations: shall mean any rules or amendments to the rules as promulgated by the Association.

Sponsor: shall mean the legal entity established as the Association for the community, its successors in interest and assigns.

### 14.6 Property Rights

For the community, property rights are defined for each land-use pod and individual house, unit, or building within the community. All of the common property, which will be owned by the community association, will be conveyed by the sponsor (master developer) free and clear of any mortgage liens or any other financial encumbrance.
The master developer should phase in the common areas, and in some cases, the final common-area conveyance will not occur until the ultimate build-out of the community occurs. The community association is obligated to accept the conveyance and will be required to properly operate and maintain the common-area property. In the case of an amenity-building designed for the entire community, the conveyance of this building early in the construction phasing will not only provide a marketing boost but will permit the sponsor to convey the operation and maintenance responsibilities to the community association.

A perpetual easement or blanket easement shall be recorded for the benefit of public agencies operating and maintaining utilities in the common areas or permit unobstructed ingress and egress by the municipality and emergency vehicles. This is most commonly associated with a project having private roads. There should be no obstruction of access to any common property.

14.7 Financial Assessments

Upon the acceptance of title to a unit, house, or lot, every owner agrees to pay the community association (Association) the yearly assessment and any special assessment deemed appropriate by the Association. This requirement is defined in the bylaws and penalties or fines may be assessed by the Association.

The board has the obligation to establish the annual common-area expense and levy an assessment sufficient for the proper operation and maintenance of the common-area facilities. In most cases, this fee established is at the sole discretion of the board.

Assessments, special assessments, or fines shall be the obligation of the owner as a member of the Association to pay on a defined schedule. The bylaws will specifically outline the financial responsibilities of the members, and state law will govern the language used in the declaration or bylaws of the Association. The bylaws will outline the process the board must follow in notifying the Association members of the annual assessment.

The board must also itemize the operation and management costs earmarked for the common-area facilities and properties. These annual assessments should not be used for capital improvement projects. The board may also entertain special or emergency assessments for projects of immediate need.

14.8 Maintenance Responsibilities

The Association will be responsible for maintaining common property throughout the large-scale property boundaries. These areas may predominately consist of natural vegetation or grassed areas with or without pedestrian paths for connectivity. The Association may also have buildings under common ownership, which may include amenity buildings, welcome centers, or meeting halls. All of which will require ongoing maintenance programs for building exteriors and interiors. The Association
should develop a maintenance program for the common areas and facilities to ensure the annual assessment is sufficient for proper operations and maintenance. This program would include routine and preventive maintenance measures.

In many active-adult communities, the individual lots and the home exterior are included in the project maintenance package. For a large-scale project, the active-adult homeowners would be responsible for their association fees and the umbrella community association fee. In active-adult communities, the annual assessments may have a bearing on its marketability if the fees are too high. This may also be the case for workforce or entry-level housing areas. The master developer needs to determine the maintenance program for the entire community and calculate the annual assessment to all members before marketing individual land-use pods to builders-developers.

14.9 Member Rights

Community association members have a nonexclusive easement for ingress and egress to and from and through the common property. Each member shall have the right of enjoyment and use of the common property. The easements provided to each member will be conditioned on dues being current. The Association may also reserve the right to charge admission or other fees for using common facilities. The Association may also reserve the right to transfer common-area property to any municipality if approved by the members.

14.10 Sponsor Rights

Expenses for common areas are allocated equally to all Association members as certificate of occupancy permits are issued. The owners to whom title has been conveyed shall be responsible for their proportionate share of all common-area expenses. Until the conveyance of the first lot, the sponsor is solely responsible for all common-area expenses. The sponsor will maintain a majority on the board of directors until such time as the bylaws indicate a transition of power from the sponsor to members. For a large-scale project, the community association will be managed by the sponsor well into the total build-out of the project. This will ensure the common-area facilities and common property are properly maintained and operating efficiently for the members.

The bylaws will typically include having the sponsor reserving for itself, its successors and assigns, for as long as the sponsor owns one or more properties within the community, the right to sell, lease, or sublease any unsold lots, units, or buildings within the community. There would be a provision allowing the sponsor to transfer the sponsor’s rights.

14.11 Insurance Provisions

The community association, as with any entity having land and facilities used by others, should have sufficient insurance in place. Each state will have different
insurance rules and regulations. The master developer should have the appropriate insurance coverage in place even during the planning process. This would ensure coverage while the design team is on site or if regulators want to undertake a site walk, etc. Each association would be responsible to have an all-risk casualty insurance policy as well as a liability policy. The community association may require each member association to furnish a copy of their insurance policy.

### 14.12 General Provisions

The general provisions of the declaration or bylaws may include legal statements consistent with the requirements of specific state law. Other general provisions may include discussions on violations, enforcement, and administration of the covenants and restrictions. This section of the document may also include the following provisions:

| Notice: | Describes the proper way in which the association members are notified of Association actions. The document will also state that members must notify of a change in address or if property has been conveyed. |
| Maintenance: | This provision outlines the course of events if the Association fails to maintain the property as required in the bylaws. The municipality may have the right and obligation to maintain the property if the association fails to discharge its obligations. |
| Amendment: | The declaration or bylaws may be amended at any time by a vote of two-thirds of the voting members. Members have to be in good standing and the vote taken at a duly held meeting in accordance with the notice provisions. |

### 14.13 Architectural Controls

The sponsor or master developer must control the aesthetic appearance of the community through the life of the project. This control will enhance property values and thus maintain salability and marketability throughout the build-out process (see Fig. 14.1). The community association should be structured as an umbrella organization that reviews and approves the architectural guidelines established for each residential or nonresidential area. Owner’s requesting changes to the original construction would follow a detailed application, review, and approval process. In many instances, any change submitted by an owner must be prepared by a licensed design professional. This may include architects, landscape architects, or an engineer. Having design professionals in the review process will ensure the design intent of the
owner has been met but also remains compatible with the surrounding properties. The improvement would also be consistent with local government regulations imposed on the property. As an example, government may stipulate a maximum percentage of impervious coverage on a per lot basis. If the homeowner wants to enlarge a patio, will the coverage exceed the maximum permitted by local government? Many homeowners would not be cognizant of these types of issues, but the design professional should be.

The architectural guidelines will outline specific criteria that must be met to receive Association approval. Basic guidelines may typically include:

- A site layout illustrating existing structures and site improvements with the proposed improvements.
- Provide building setback lines.
- Architectural working drawings of the improvements showing dimensions, materials, form, and colors. This may be also be required for landscaping improvements.
Detailed construction specifications of the improvements. The owner should include a list of the contractors used for construction.

Completion and submission of a design-review application form to the architectural control committee for review and action. In some cases, there may be a fee associated with each submission.

The master developer should establish the architectural review process before the land-use-plan application is made to local government. There is a balance in establishing the proper level of control. The controls may be restrictive but not administered properly. Or the controls may be vague and interpretative and administered without flexibility. Master developers should consider a more strict approach and limited flexibility while they are in control of the association. It is incumbent upon the master developer to protect the interests of the entire community throughout build-out.

**14.14 Summary**

Each state will regulate community associations and homeowners associations to some extent. Master developers should retain a law firm with expertise in the preparation of association documents. The documents must be in compliance with all applicable laws and regulations. In many jurisdictions and markets, the associations are hiring legal and engineering expertise to protect their interests prior to accepting the common-area property and facilities from the sponsor. The professionals retained by the owners will use the construction plans and documents approved by local, regional, and federal agencies as a guide. It is incumbent upon the master developer to ensure the infrastructure has been properly inspected for compliance. Proper record keeping by a third-party inspector or local building official should be sufficient during the turnover process. If there are design or construction changes implemented by the sponsor after approvals, the master developer needs to properly document these changes with local officials.

Turnover inspections by owner representatives will focus on the site and building improvements for compliance with approved construction plans, manufacturer specifications, and building codes with local amendments. The second phase of the field review will focus on the quality of construction. In both cases, Association members are striving to protect themselves from accepting infrastructure or facility improvements not in accordance with government regulations or of good quality construction. The association fees include capital replacement costs for certain physical improvements that have a standard life. But Association members do not want to replace elements of the common facilities before necessary, and they do not want to accept subpar quality workmanship necessitating alterations and incurring costs. The master developer should implement a quality control program to ensure that common facilities are constructed properly and in accordance with the approved plans. And by keeping detailed records, the master developer may have a smoother turnover process to the association membership.
DISCUSSION TOPICS

1. As a master developer, what restriction is typically imposed to retain property values and why?

2. Should the master developer hire a management firm to handle the community association or attempt to manage the affairs themselves until turnover?

3. What measures can the master developer take to ensure the turnover process is smooth in transitioning the common-area amenities to the members?

4. Should the master developer establish defined restrictions on nonresidential property to permit more design freedom for creativity rather than conformity?
Chapter 15

Costs and Budget

15.1 Introductions

Any land-development project, regardless of size in area or units, requires a schedule for completion, a budget, and a cash-flow analysis. This chapter will not evaluate the available cash-flow software packages available on the market but will focus on costs and budget preparation.

Costs will vary considerably across the country. Union labor is a factor in certain locations, while limited contractor selections may skew costs in another area. Preparing a conceptual budget based on estimated quantities and unit prices is necessary for an evaluation of the financial viability of the final land-use plan. There will be costs added to the project as it is reviewed and approved by regulatory agencies. The master developer needs to understand the costs of the project during negotiations for an approved land-use plan. Many design elements may only be conceptual, but budgets must be established for all work items for which the master developer will be held responsible.

Once the land-use plan has been approved, the design phase project concepts will be initiated and implemented. The design and associated costs should be under constant oversight and monitored carefully. Discretionary land-development costs are generally associated with nonessential community elements that enhance marketability. Having a budget established for each element will allow cost comparisons as the design is being prepared. Do not wait until the design is complete.

15.2 Role of the Master Developer

Material and labor prices are on the increase, but the cost ranges provided in this chapter allow the master developer to prepare a conceptual project budget. This conceptual budget is based on the final land-use plan submitted to the regulatory
agencies for approval. The master developer needs to be the orchestra leader of creative and technical minds. Guidance must be given to control creative design. The design must complement the project design program, function, be practical, be cost effective, and be within budget. Developers all too often accept fantastic design concepts and wait for the final designs to be completed before knowing the costs. They are disappointed, more often than not, that the design does not meet the budget. This causes delays, requires a redesign, and may result in consultant discontent—founded or unfounded. The role of the master developer is to manage professionals so they complete their work on time and within budget.

15.3 Site Selection and Land

Land prices vary considerably across the country. Property purchased for a large-scale project may have multiple owners. Each owner will have a price in mind that is not necessarily consistent with the other property owners. Most landowners, today, know the value of land in their community. For a successful project, the developer needs to purchase the property below market value. Although there may be comparatives in the area, each parcel of land has its own inherent value. As an example, a 50-acre parcel with substantial road frontage, sewer at the site, and no wetland areas would probably be sold at a premium. While a 50-acre site with a floodplain and only 25 percent of the site suitable for development purposes should have a lower per acre price.

Many times, the property is sold on a gross per acre basis and not on a net buildable area. In this example, the landowner with the floodplain will not accept a sales price lower than the adjacent parcel. The art of negotiation is to use the due-diligence reports and information in these discussions. The developer should illustrate how the site characteristics affect the value of the property by constraining development potential.

15.4 Design Team Members

Budgets for each element of design should be conveyed to the design team. In terms of hard infrastructure elements, such as storm drainage, the engineer should strive to reduce costs through value-engineering approaches. The infrastructure budgets should not be changed, since contingencies should be added into the land-development budget. For hardscape and softscape elements, design team members should be designed in accordance with the budget set for each element. Entry features, amenity complexes, active recreation uses are creative products where land-development infrastructure is based on engineering practices and criteria (Fig. 15.1). Creative design team members must be managed and held accountable for the budget.

Each design team member should provide quantities associated with their design. For land-development activities, the developer should use engineering quantities to obtain contractor bids. The developer would only have to evaluate the unit
prices, unless there are discrepancies in the quantities. This would expedite the bid comparison for subsequent negotiations. The developer should be involved in preparing the design program for each design element within the project. Based upon the design program, the developer will establish construction budgets for each item and provide this guidance to the appropriate design team member. The developer may need input from the design professionals to set a reasonable budget. As an example, if the traffic study indicates intersection improvements and the installation of a traffic signal, the traffic engineer should assist the developer in establishing a reasonable budget for the work.

15.5 Project Infrastructure

The cost ranges are based on experience and input from engineers, contractors and developers from across the country. The ranges in cost may be extreme in some cases but reflective of the differences in construction requirements. As an example, the clearing costs incurred in Arizona will be substantially different than experienced in Vermont.
Design team–member professional services and their fees will reflect the complexities of the project, its size, and location. Also, the design program will also affect the scope of work and fees. The fees are estimated only for the services required to obtain the overall land-use plan approval from the zoning board. Design services and associated fees would be over and above the fees listed. Each consultant would structure their design scope and fee specifically for each project.

**Due-Diligence Services, Land-Use-Plan Preparation, and Impact-Studies Budgets**

<table>
<thead>
<tr>
<th>Service</th>
<th>Cost Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Market research</td>
<td>$10,000–$35,000</td>
</tr>
<tr>
<td>Surveying (boundary and topographical)</td>
<td>$500–$2,000/acre</td>
</tr>
<tr>
<td>Environmental (phase I and wetlands)</td>
<td>$10,000–$25,000</td>
</tr>
<tr>
<td>Environmental impact study</td>
<td>$15,000–$30,000</td>
</tr>
<tr>
<td>Soil testing (borings and test pits)</td>
<td>$15,000–$50,000</td>
</tr>
<tr>
<td>Land planner (land-use-plan options)</td>
<td>$10,000–$30,000</td>
</tr>
<tr>
<td>Civil engineer</td>
<td>$15,000–$40,000</td>
</tr>
<tr>
<td>Marketing firm</td>
<td>$10,000–$40,000</td>
</tr>
<tr>
<td>Public relations firm</td>
<td>$5,000–$25,000</td>
</tr>
<tr>
<td>Architect</td>
<td>$15,000–$40,000</td>
</tr>
<tr>
<td>Landscape architect</td>
<td>$10,000–$25,000</td>
</tr>
<tr>
<td>Economist</td>
<td>$10,000–$20,000</td>
</tr>
<tr>
<td>Traffic engineer</td>
<td>$15,000–$30,000</td>
</tr>
<tr>
<td>Water and wastewater engineer</td>
<td>$5,000–$20,000</td>
</tr>
</tbody>
</table>

**Site Construction Budgets**

<table>
<thead>
<tr>
<th>Item</th>
<th>Cost Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surveying construction stakeout</td>
<td>$300–$800/unit</td>
</tr>
<tr>
<td>Engineering certifications</td>
<td>$5,000–$10,000</td>
</tr>
<tr>
<td>Soil erosion and sedimentation control</td>
<td>$500–$15,000/ac</td>
</tr>
<tr>
<td>Clearing</td>
<td>$1,000–$10,000/ac</td>
</tr>
<tr>
<td>Earthwork (of cleared area)</td>
<td>$5,000–$15,000/ac</td>
</tr>
<tr>
<td>Soil testing</td>
<td>$500–$2,000/ac</td>
</tr>
<tr>
<td>Storm drainage pipe</td>
<td>$1.50–$3.00/in/ft (24-in RCP × $2.00/ft = $48.00/ft installed)</td>
</tr>
<tr>
<td>Storm-drain inlets</td>
<td>$2,000–$5,000 each</td>
</tr>
<tr>
<td>Storm-drain manholes</td>
<td>$3,000–$9,000 each</td>
</tr>
<tr>
<td>Storm-water management facilities</td>
<td>$10,000–$25,000/ac</td>
</tr>
<tr>
<td>Best management practices</td>
<td>$5,000–$30,000 each</td>
</tr>
<tr>
<td>Sanitary sewer pipe (standard 8-inch PVC)</td>
<td>$25–$35/ft</td>
</tr>
<tr>
<td>Sanitary sewer service connections</td>
<td>$300–$600 each</td>
</tr>
<tr>
<td>Sanitary sewer manholes</td>
<td>$2,000–$6,000 each</td>
</tr>
</tbody>
</table>
15.7 Common Area Improvements Budgets

<table>
<thead>
<tr>
<th>Item</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water-line pipe (including valves, Ts, etc.)</td>
<td>$20–$35/ft</td>
</tr>
<tr>
<td>Water service connections</td>
<td>$300–$600 each</td>
</tr>
<tr>
<td>Fire hydrants</td>
<td>$2,000–$5,000 each</td>
</tr>
<tr>
<td>Underground electric</td>
<td>$2,000–$5,000/unit</td>
</tr>
<tr>
<td>Curb and gutter</td>
<td>$8–$12/ft</td>
</tr>
<tr>
<td>Driveway aprons</td>
<td>$500–$2,000 each</td>
</tr>
<tr>
<td>Roadway pavement</td>
<td>$15–$25/sq yd</td>
</tr>
<tr>
<td>Sidewalk</td>
<td>$2–$6/sq ft</td>
</tr>
<tr>
<td>Street signs</td>
<td>$200–$500 each</td>
</tr>
<tr>
<td>Streetlights (electric co., standard)</td>
<td>$500–$1,500 each</td>
</tr>
<tr>
<td>Street trees (2½ to 3 inch caliber)</td>
<td>$300–$600 each</td>
</tr>
<tr>
<td>Road improvements with utilities</td>
<td>$300–$800/linear ft</td>
</tr>
</tbody>
</table>

(Remember, minimizing the pavement width and total length of proposed roadways will provide the best opportunity to manage land-development budgets cost effectively.)

15.6 Off-Site Improvements Budgets

<table>
<thead>
<tr>
<th>Item</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Traffic signal</td>
<td>$150,000 + each</td>
</tr>
<tr>
<td>Sewer trunk line</td>
<td>$60–$150/ft</td>
</tr>
<tr>
<td>Water trunk line</td>
<td>$80–$120/ft</td>
</tr>
<tr>
<td>Frontage road widening</td>
<td>$300–$600/ft</td>
</tr>
</tbody>
</table>

15.7 Common Area Improvements Budgets

<table>
<thead>
<tr>
<th>Item</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bike paths</td>
<td>$10–$20/sq yd</td>
</tr>
<tr>
<td>Pedestrian paths</td>
<td>$10–$15/sq yd</td>
</tr>
<tr>
<td>Intersection pavers</td>
<td>$20–$50/sq yd</td>
</tr>
<tr>
<td>Crosswalk surface treatment</td>
<td>$15–$30 sq yd</td>
</tr>
<tr>
<td>Signage</td>
<td>$200–$600 each</td>
</tr>
<tr>
<td>Lighting: special fixtures</td>
<td>$1,000–$3,000 each</td>
</tr>
</tbody>
</table>

Landscaping  There are no hard and fast rules, because the cost will vary with design, material selection, and the project element to be landscaped. Establish a reasonable budget to ensure the landscaping design is substantial no matter the application. Do not sacrifice the landscaping budget: plant material is what people will see, and it forms their impression of the project.

Irrigation  This will follow the landscape design. Water resources may limit the ability to irrigate. Thus, retaining natural vegetation or designing with drought-resistant plant material and grasses would be the best approach.

Other facilities  Dog park, picnic areas, boat ramp, nature trails, bird-watching stations, obstacle course, Frisbee golf course, garden plots.
15.8 Recreation Facilities and Amenities Budgets

<table>
<thead>
<tr>
<th>Facility</th>
<th>Cost Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Golf courses</td>
<td>$150,000–$350,000/hole</td>
</tr>
<tr>
<td>Playgrounds or tot lots</td>
<td>$20,000–$50,000 each</td>
</tr>
<tr>
<td>Outdoor pools, including wading pools</td>
<td>$50–$150/sq ft</td>
</tr>
<tr>
<td>Soccer field</td>
<td>$20,000–$40,000 each</td>
</tr>
<tr>
<td>Tennis courts</td>
<td>$15,000–$30,000 each</td>
</tr>
<tr>
<td>Volleyball courts</td>
<td>$2,000–$5,000 each</td>
</tr>
<tr>
<td>Shuffleboard courts (pair)</td>
<td>$3,000–$6,000 each</td>
</tr>
<tr>
<td>Basketball courts</td>
<td>$4,000–$10,000 each</td>
</tr>
<tr>
<td>Bocci courts</td>
<td>$3,000–$8,000 each</td>
</tr>
<tr>
<td>Skateboard tracks</td>
<td>$25,000–$50,000 each</td>
</tr>
<tr>
<td>Walking track</td>
<td>$10,000–$15,000 each</td>
</tr>
<tr>
<td>Paintball field</td>
<td>$8,000–$20,000 each</td>
</tr>
<tr>
<td>Softball and baseball fields</td>
<td>$25,000–$50,000 each</td>
</tr>
<tr>
<td>Amenity building (only)</td>
<td>$120–$250/sq ft</td>
</tr>
</tbody>
</table>

15.9 Entry Features and Project Signage

<table>
<thead>
<tr>
<th>Feature</th>
<th>Cost Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary entry feature</td>
<td>$25,000–$500,000 + each</td>
</tr>
<tr>
<td>Secondary entry features</td>
<td>$10,000–$50,000 + each</td>
</tr>
<tr>
<td>Community road signage</td>
<td>$500–$1,000 + each</td>
</tr>
</tbody>
</table>

15.10 Regulatory Fees

With over 40,000 local municipalities, thousands of county governments, multiple state agencies, and federal government agencies having a role in the land-development industry, the size of regulatory fees are found at both ends of the spectrum. Each step in the regulatory process requires application and review fees from multiple agencies. Since each local land-development process may have special review considerations, the following list may not be all inclusive:

- Application fee for submitting the land-use plan
- Payment for special hearings, legal notices, and neighborhood meetings
- Cost for local government to review the land-use plan
- Payment of impact fees, if applicable
- Application fee for construction-document review, preliminary plat, and final plat. The applications to each agency may also require posting monies for the review of the plans in addition to the application fee. In some cases, outside engineering firms are retained to review engineering plans, and their total cost for reviewing the plans will be reimbursed by the developer.
Application fees to various local departments, including the fire department, tax assessor, school board, police department, public works department, etc.

- Application fees to the water and sewer departments
- Payment of water- and sewer-capacity reservation and/or connection fees
- Application fees to the Department of Transportation (DOT), environmental agency, consumer affairs department (review HOA, or homeowners association, documents), etc.
- Application, permit, and inspection fees to the Soil Conservation District
- Application and permit fees to the U.S. Army Corps of Engineers
- Construction permits required from the building department
- Performance bonds for construction and inspection fees paid to local government
- Recordation fees
- Resubmission fees to any agency requiring the plans to be reviewed after the initial submission
- Utility agreement costs for electric, telephone, or natural gas

Since large-scale master plans provide mixed uses, the fees will vary for residential and nonresidential uses. Site-plan reviews for nonresidential applications typically cost more to process than residential subdivisions. For perspective on the magnitude of soft costs associated with regulatory reviews and approvals, the range would be from $2,000 per unit to $100,000 per unit. The upper end of the spectrum is associated with highly regulated areas imposing significant impact fees on each residential unit. Impact fees are passed on to the new home buyer.

15.11 Financial Analysis

Cash-flow analysis requires many financial goals, market data, price points, absorption rates, project specifics, and so forth, and each large-scale project will be different—even if located in the same marketplace. Without a question, the master developer and the financial group will continuously prepare cash-flow projections as the land-use plan is finalized. Changing land uses to generate more revenue or revising design elements to reduce costs will continuously revise the cash-flow analysis. The cost and budget information will be used to prepare an initial cash-flow analysis based on many projections by the master developer.

On the revenue side, individual land-use parcels will have a sales price established with an absorption rate. With the revenue projections and conceptual budgets, the master developer will rely on the financial group to prepare a final cash-flow analysis on the final land-use plan. Once the application process is imminent, any major or significant change to the plan would be detrimental to the overall project schedule. The master developer should have reached the proper balance between costs and revenue by this time in the process.
There are numerous cash-flow software programs on the market. Due to the numerous variables involved in the planning process, the software selected should be user friendly and have easy to change parameters. The financial analysis for the final land-use plan will be used as the benchmark for comparing preliminary and final design plan cost estimates. Construction bids will also be compared against the budgets and the cash-flow analysis prepared for the final land-use plan. The goal is to stay on schedule and within budget.

15.12 Summary

During the land-use planning process, the master developer will prepare a line-item budget and cash-flow analysis on a continuous basis. The budget process represents the expenditures necessary to construct the complete community infrastructure. The developer should rely on the design team members for quantities and estimated unit prices for various elements of work. In addition to this information, developers can obtain cost information from contractors, National Association of Home Builders, and from publications.

Many design elements are unique to the project and general cost information may not be relative. However, infrastructure costs will vary in a relatively narrow range but will skew because of many factors, for example, union labor costs, material shortages, expensive construction details, or limited contractor selections. The costs outlined in this chapter provide ranges that can be used in developing initial budgets for each element of work. The rule-of-thumb approaches should be modified consistently with each specific market location. The cost approach is for conceptual-cost estimating, to be tracked during preliminary and final-design cost estimating and budget preparation.

DISCUSSION TOPICS

1. What recreation facilities would be best suited for a large-scale project having extremely high land prices?
2. Which design team member(s) should be retained for recreation facility designs?
3. Which land-development line item can be negotiated with local government for cost savings, and why?
4. Which land-development line item has the greatest perceived value?
Chapter 16

Community-Design Trends

16.1 Introduction

Baby boomers are aging, workforce housing is disappearing, and 40,000 municipal governments are continuously changing regulations. Since the land-development industry is fragmented and community needs vary, government will be guiding development practices instead of the land-development industry. The land-development business is market driven. Most municipal ordinances are antiquated and not refined enough to encourage large-scale development projects. Land-use planning for market segmentation, community sustainability, and consensus building among vested interest groups are concepts only achieved by large-scale developments and orchestrated by developers with vision.

16.2 Sustainability

Infrastructure sustainability is difficult to attain in a fragmented regulatory system. However, community sustainability can be achieved by designing and constructing large-scale projects. Master-planned projects provide a balance between residential market segments. It also provides an important balance between residential and nonresidential uses—all of which supports the notion of community sustainability.

Comprehensive-infrastructure design, alternative-energy sources, and mixed uses of large-scale projects rather than disjointed development practices must be recognized as the most reasonable development trend achieving sustainability. Shared community goals, environmentally conscious, and profitability are factors that must be considered in concert to achieve sustainability. Land-use planning and comprehensive-infrastructure design of large-scale projects addresses these factors. Land developers and government entities need to work together on projects of
Chapter 16 Community-Design Trends

Figure 16.1 Development Trends. Mixed-use projects within a master-planned community and mixed uses within buildings will reshape our developmental approaches. The need to facilitate live-work opportunities, minimizing vehicle travel and enhancing a sense of belonging, will result in sustainable communities.

significance for their community. Molding large-scale projects into an existing community environment will strengthen the notion of sustainability (see Fig. 16.1).

16.3 Core Development Strategies

As the market changes, master-planned communities have the inherent flexibility to change land uses as market demands change. Flexibility is especially important for developers who hope to attain success during a lengthy build-out period. The land-absorption phase can take many years, and markets will shift during this period. Developers must be afforded regulatory concessions to allow land-use flexibility without being subjected to another rigorous regulatory review. This only adds time and costs when the results are only positive, since the developer is responding to the market.

Managing project cash flow is a necessity, and it starts during the design phase of the project. Once the blueprint has been cast, the cost of developing the core
infrastructure cannot be revised for substantial cost savings. Thus, a successful project is tantamount to successfully managing design disciplines. Consultants must be micro-managed at the outset, so the project not only stays on time and on budget but the cash flow goals are adhered to. The core infrastructure should be designed in phases, which would necessitate the land planning reflecting this approach. Phasing allows the developer to stop construction at defined sequences, but it does not preclude them from building additional phases one at a time. Only the market and financial partner will influence the decision on how fast to construct the project.

16.4 Density Factors and Perceptions

High-density residential and mixed-use projects are solutions and not the problem. The problem can be defined as local governments concluding that high-density housing projects have adverse impacts on the community. High-density housing seems to be associated with first-time home buyers and first move-up markets. These projects would generally be marketed to young families and perhaps buyers on the lower end of the economic scale. The perceptions are that high-density housing: (a) adds more school-age children to already overcrowded schools; (b) increases traffic on already congested public roadways; (c) stresses public services; (d) concentrates the populace in one location, resulting in unwanted social behavior; (e) increases the crime rate; (f) fails in architectural presentation; (g) results in the lack of grounds and building maintenance; and (h) serves as a profit windfall for the developer.

In some instances, all of the above may very well be correct. Since government zones property, it dictates the uses and controls how the community will grow. Most local planning and zoning approaches encourage fragmented developments, which are isolated and disjointed and without a sense of community. Government must reanalyz their approach to individual property zoning and initiate master planning for existing areas as well as for growth areas. Since many large metropolitan areas are in redevelopment phases of growth, it is important for government to recognize the benefits of large-scale design and development practices and apply these practices to planning areas encompassing the entire existing community. Balancing residential and nonresidential uses in community-planned town centers will allow fragment developments to occur but to become an integral part of a larger purpose. In planned town centers, similar to a large-scale development plan, high-density housing is essential to fully utilize existing infrastructure and services. Communities will promote workforce-housing opportunities, resulting in families staying together and achieving a greater sense of belonging. Higher density is the answer to providing workforce housing, to achieving successful inner city–town centers, and to balancing uses within a large-scale project. Higher-density housing in master-planned communities or planned town centers in existing communities will result in more land left undisturbed. Also, the benefits of town-center planning for existing communities include limiting sprawl and disjointed development practices.
16.5 Summary

- Public perceptions must change in reference to the benefits of high-density housing.
- Developers must strive to create a large-scale master plan or be part of a planned town center. Fragmented development patterns will eventually disappear due to the need for proper utilization of land.
- Government must revise their ordinances to recognize large-scale-project planning and the need to balance residential and nonresidential uses.
- Government must change their approach to reviewing and permitting large-scale projects. They must provide flexibility of change without the burden of multiple regulatory hearings, added costs, and prolonged regulatory delays.
- Government must be proactive in planning the implementation of town-center concepts into their municipality to foster a greater sense of community, so that even the isolated project shares in the sense of community.
- All vested-interest groups must foster a consensus-building environment, resulting in sustainable developments.
- Master developers of large-scale projects invest in an existing community. As entrepreneurs, they should benefit from taking risks and be encouraged to reinvest in the community. Yes, they make a profit that all businesses strive to achieve, but they reinvest a majority of their earnings into the next project. This is what master developers do for a living.
- Community-design trends are influenced by master developers who are creating marketable, cost-effective, profitable, and environmentally sensitive large-scale projects. Large-scale project planning is the only means to achieve sustainability based on economic, social, and environmental factors.

DISCUSSION TOPICS

1. Why may the general public reject high-density housing in their community?
2. What are factors that may hinder developers from proceeding with large-scale project concepts?
3. Should a developer of a successful large-scale project plan to duplicate the same concepts in another marketplace? Why or why not?
4. Which land-development engineering-design practices promote sustainability?
Case Study

17.1 Introduction

The intent of this case study is to outline the design program elements and associated budgets based on this specific land-use plan.

Master Developer’s Experience

- Custom Home Building firm seeks to develop lots for the developer’s own use.
- Primarily builds large custom homes on lots owned by individuals.
- The firm’s only land-development experience consisted of a ten-lot subdivision.
- Long-time community resident, not politically involved.
- Excellent reputation as a quality custom home builder.

Contract Provisions

- A 245-acre, vacant parcel under single ownership.
- The property is zoned residential at one dwelling unit per acre.
- 120 days were negotiated for the due-diligence period.
- An additional deposit will be required upon completion of the due-diligence period.
- The contract will go hard once the rezoning and proposed land-use plan have received local government approval. No time limits were imposed on obtaining approval, and option payments are not required.
- Total raw land price is $14,700,000 (245 acres \( \times \) $60,000 per acre)
Impact-Study Conclusions

- Off-site road improvements are required, including frontage-road widening and contributions toward future traffic signals. Turning lanes will be required at both entrances.
- School impact fees in this jurisdiction are not legal. The real estate property tax assessed on homeowners includes the school budget.

Site-Analysis Conclusions

(See Figs. 17.1–17.4)

- The frontage on Highway 54 would be considered in-fill; primarily commercial uses.
- The frontage on Route 79 is located in a developing area; primarily residential uses.
- Steep topography in many areas of the site; great views and heavy vegetation.

Figure 17.1 Case Study Site Characteristics.
Several jurisdictional streams exist on-site, requiring 30-foot buffers.

- A pocket wetland exists on the northern boundary.
- Flood prone areas are not an issue on this property.
- Higher elevations of the site have specimen trees and is heavily forested.
- Lower elevations of the site are cleared areas.
- Soils investigation identified four areas containing unsuitable soil.
- Highway 54 is a major arterial roadway.
- Route 79 is a collector roadway serving residential neighborhoods.
- Water-supply and sewage-treatment plant capacity fees assessed at building permit stage.
- Existing 12-inch-water mains exist in both frontage roads.
- Existing 10-inch sewer lines exist in both frontage roads; the site topography provides sufficient elevation change for gravity sewer.
- All other utilities, including natural gas, are in the area.
Chapter 17 Case Study

Figure 17.3 Case Study Site Characteristics.

Market-Study Conclusions

(See Figs. 17.5, 17.6, and 17.7)

- Estate housing on 125-feet wide lots
- Average price point at $800,000
- Slow absorption rate at 3 to 4 units per year
- Medium-density housing on 90-feet-wide lots
- Average price point at $450,000
- Absorption 4 to 5 units per month
- Medium-density housing on 70-feet-wide lots
- Average price point at $325,000
- Absorption 5 to 6 units per month
- High-density multifamily on greater than 18 units per acre
- Average price point at $275,000 (workforce housing)
- Absorption 10 to 12 units per month

- Community is in need of a business park marketed to major corporations expanding in the region. The need is for high-quality professional office space
Figure 17.4 Site-Analysis Plan. The base map incorporates the boundary and topography surveys with soils information, slope analysis, environmental constraints, views, access points, and areas for development potential. Lance Lindsey, Planner for ESP Associates, P.A., Charlotte, North Carolina, prepared the site-analysis plan and used this planning tool effectively in allocating land uses.

marketed to established corporations, and this is a community hot button issue.

**Design Program**

- Provide a sense of community by providing live-work opportunities.
- Provide a major central amenity center for the entire project.
- Establish two access locations. Project road access to existing frontage roads.
- Each land-use parcel will be responsible for storm-water management and best management practice facilities since the topography creates multiple drainage areas within each land-use area.
- Market and sell land uses from both access points.
Chapter 17 Case Study

Figure 17.5 Market Considerations. The developer is a custom home builder seeking to control his or her own lot availability through a master-planned community. The property is located in an estate area suitable for the developer’s housing expertise.

- Provide custom home-building lots to be retained by the master developer.
- Include workforce-housing product.
- Include business and professional office uses.
- Include at least four different residential land uses marketed to builder-developers having expertise in each specific use.
- Design the project in phases.

17.2 Land-Use Plan

The site characteristics and parcel configuration is suitable for a more conventional land-use approach. Also, it would be consistent with adjacent land uses and adhere to the market-study conclusions. The land area in the higher elevations of the site includes specimen trees and heavy vegetation. The proper utilization of this key area is important for the success of the project. The ability to retain the existing characteristics will enhance the marketability of the project. Creating an enclave of
exclusive residential homes will provide lots for use by the master developer. The developer may also elect to sell lots to other custom home builders to increase the absorption rate. The lots will be oversized to encourage selective clearing and custom layouts for each lot. Secondary access locations will primarily serve the estate residential area. These proposed roads will connect to existing residential roads.

The Highway 54 corridor is prime commercial property. The Highway 54 frontage is best suited for commercial and retail uses requiring high visibility. The road frontage will provide an adequate presentation of the project. A major entrance feature will be designed on Highway 54. The entrance road would be a dual road access with a median for planting and turning lanes for entrance into the business parks. Direct connections to the boulevard will be limited, and sufficient building setbacks will be maintained, creating a grand entrance into the project. This boulevard would connect to a roundabout, directing vehicle movement to the interior residential collector roadway.

Route 79 is a residential connector serving various residential uses and vacant land beyond this project. The project frontage on this road is limited and adequate
Figure 17.7 Workforce Housing. The project design program includes housing opportunities for teachers, police officers, firefighters, government employees, and all others joined by a sense of belonging by living and working in the same community.

budgeting for a residential “window” will provide a significant project statement. The access into the community from Route 79 will also be a boulevard design with divided travel lanes and a landscaped center median. The residential area bordering the entrance boulevard would not have driveway access. This allows for mounding, hardscape, and softscape elements along the right-of-way.

Entry features will be designed for each primary access to the proposed project. Secondary entry feature will be designed at the roundabouts. Pedestrian paths will be designed throughout the project, connecting residential uses with the neighborhood commercial village.

The residential uses will employ a residential collector road for access to the boulevard entrance roads. Roundabouts have been designed as memory points and traffic-calming facilities. The central amenity site is planned as a focal point for the residential entrance to the community. High-density townhouses will be a transition from the business park to residential uses. Medium-density residential lots will be segregated into 70- and 90-foot wide single-family lots. The 70-foot lot width lot project is not large in terms of unit count and, by selecting the correct
The builder-developer for this project, will be essential to the overall success of the project. The master developer must be very selective of the builder of the phase one project since it is located at the entrance to the entire community. The 90-foot width lots will be a transitional use, leading to the low-density estate area. The 90-foot lot product will be a move-up market and will allow side-entry garages. This product allows the greatest flexibility in design and will attract the most buyers. Due to the layout, the master developer may consider dividing the project into two distinct areas. Thus, the land could be absorbed quicker by selling two smaller projects rather than one larger, more expensive project. The move-up market for 70- and 90-foot width lots has the greatest market depth.

The community hot-button issue is a lack of a quality business parks to attract corporations seeking to expand to the region. By including a 20-acre business park comprised of two separate parcels, the master developer has presented a solution to an existing community need (Fig. 17.8). Also by planning for a neighborhood commercial village with a live-work design concept, the master developer has created an environment in which people can live and work in the same project. Pedestrian connectivity to the business centers will further define this proposed land-use plan and community concept as a sustainable community.

17.3 Master Plan

Phase one will include constructing both entrance boulevards to the roundabouts (Fig. 17.9). The drainage for these roadways will be conveyed to the detention basins located in the business park and on the amenity site. Water, sewer, and other utilities will be extended along the boulevards. This initial infrastructure construction will provide substantial entrances to the community and provide immediate accessibility to the medium-density, single-family, 70-foot-width project. This parcel would be marketed to a prominent local builder for the first move-up market. This project would contain 71 lots and have a build-out period of two years.

The boulevard access to Highway 54 will be constructed to the roundabout and provide access to the high-density multifamily project, business parks, and the neighborhood commercial village. Builder-developers of each of these projects will have different company profiles. In fact, the business park may be purchased by several entities. The park could be platted into four separate parcels.

The construction of the amenity complex will be started in the second phase for marketing the high-density and medium-density 90-foot lots. This would require the design and planning of the facility to be submitted for site-plan approval before releasing phase two for sales. In fact, the amenity center could be started in phase one without causing additional infrastructure improvements. This will be a cash-flow decision rather than a marketing decision.

Phase two of the project would consist of the residential collector road connecting the roundabouts and providing another access from the project to an existing municipal roadway (Fig. 17.10). With this improvement, the high-density, multifamily, and
Chapter 17 Case Study

Figure 17.8 Business Park. The community hot-button issue for this case study is the need for a new business park catering to major corporations expanding in the region. There is a community need for high-quality professional office space.

medium-density, single-family 90-foot-lot projects could be released for sale. The last phase would consist entirely of the estate lots. Since this will be a custom home estate enclave, the absorption rate will be slow. However, the master developer is a custom home builder and this plan delivers 71 estate lots, ranging from three-quarters to 3 acres. The area for the estate lots is heavily wooded with steep topography, providing excellent site characteristics for high-end housing that is customized for each lot. The topography provides a physical separation from adjacent uses. Thus, the site characteristics create an exclusive residential area. Each homeowner would still belong to the umbrella community association.

17.4 Budgets and Overall Pro Forma

During the land-use planning process, the master developer should be monitoring the design concepts and preparing an ongoing cash-flow analysis. The design program outlined for the project will have budgets assigned to major components. The conceptual budget process should be completed during the due-diligence period.
Figure 17.9 Land-Use Plan. Prepared by Lance Lindsey, Planner for ESP Associates, P.A., Charlotte, North Carolina. The land-use plan is the official document for rezoning the property. The plan shows the major road connections and land uses consistent with the market study and community hot-button issues.

The developer must determine if the project as visualized will work financially and adheres to the established development goals. The builder-developer is a custom home builder, and the goal is to control the availability of lots for the builder-developer’s own use. The custom home builder wants to create lots for the builder-developer’s use and receive the rewards associated with the risk of developing land. Each budget will be revised as the project and design concepts are further refined. These budgets would be finalized once the plan has been submitted to the appropriate regulatory agency for review and approval.

If conclusions of the budget process indicate the profit margin as unacceptable, the master developer must reevaluate the design program, seek well defined and up-to-date market information, and decide whether or not to walk away from the project. The budget estimates provided in Chapter 15 are based on cost information from specific markets. National cost data derived from general national cost-estimating books or manuals generally are not reliable for specific markets. Knowing local construction practices and costs is essential in making an informed go-or-no-go decision. Altering
cost information, making market concessions, or changing the design program, forcing a go decision may not result in a profitable project. There are times when land developers should walk away from a project before the contract goes hard, rather than find ways to make it work financially. In most instances, the raw land price is the key to success. If the project pro forma does not “pencil out,” the first step is not to revise the project assumptions but to renegotiate with the land seller. After all, another developer would essentially come to the same conclusions. Then, it would be in the best interests of the seller to work with a reputable firm. Raw land-price concessions or revising the payment-schedule provisions may positively affect the cash-flow requirements. If all efforts fail to achieve a reasonable return, the developer should let the contract lapse and request the return of all deposited funds.

After the initial land-use and master-plan approach has been completed, main category cost budgets and estimated revenue projections should be established. This approach is not to be substituted for a cash-flow analysis. The intent is to prepare a concept pro forma based on budget assumption, specific market price points, and land-use plans during the due-diligence period of the contract.
### Cost-Revenue Pro Forma

#### Costs:

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<thead>
<tr>
<th>Description</th>
<th>Cost</th>
</tr>
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<tbody>
<tr>
<td>245 acres of vacant land with frontage on Highway 54 and Route 79, negotiated sales price at $60,000 per acre</td>
<td>$14,700,000</td>
</tr>
<tr>
<td>Design Team Professional Fees</td>
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<td>Market Research Firm</td>
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<td>Surveying: Boundary and Topography</td>
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<td>Environmental Phase I and Wetlands</td>
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<td>Environmental Impact Study</td>
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<tr>
<td>Water and Wastewater Engineer</td>
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<td>Residential Collector (1,300 lf x $600/lf)</td>
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### Chapter 17 Case Study

<table>
<thead>
<tr>
<th>Description</th>
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<tr>
<td>Entry Features</td>
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<tr>
<td>- Primary Entry Features at Highway 54 and Route 79 Access Locations</td>
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</tr>
<tr>
<td>- Secondary Entry Features at the roundabout locations and entrances to land-use pods</td>
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</tr>
<tr>
<td>Community Signage</td>
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<tr>
<td>Road Frontage Berms, Landscaping, Lighting</td>
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<tr>
<td><strong>Amenity Complex and Recreation Facilities</strong></td>
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<td>- Building 10,000 sq ft at $180/sq ft</td>
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<td>- Outdoor Pool and Wading Pool; Deck</td>
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<td>- Tennis Courts</td>
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<tr>
<td>- Volleyball Courts</td>
<td>$5,000</td>
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<tr>
<td>- Bocci Courts</td>
<td>$5,000</td>
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<tr>
<td>- Walking Track</td>
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<td><strong>Interest Budget</strong></td>
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<td>$1,875,000</td>
</tr>
<tr>
<td><strong>TOTAL COST BUDGET</strong></td>
<td><strong>$25,747,500</strong></td>
</tr>
</tbody>
</table>

### Revenue:

<table>
<thead>
<tr>
<th>Description</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commercial Live-Work</td>
<td>$2,400,000</td>
</tr>
<tr>
<td>Business Park</td>
<td>$6,000,000</td>
</tr>
<tr>
<td>High-Density Residential</td>
<td>$3,520,000</td>
</tr>
<tr>
<td>Medium Density</td>
<td>$3,550,000</td>
</tr>
<tr>
<td>70-ft-lot width</td>
<td>$8,680,000</td>
</tr>
<tr>
<td>Medium Density 90-ft-lot width</td>
<td>$7,100,000</td>
</tr>
<tr>
<td>Low-Density Estate Lots</td>
<td>$31,250,000</td>
</tr>
<tr>
<td><strong>TOTAL REVENUE BUDGET</strong></td>
<td><strong>$31,250,000</strong></td>
</tr>
<tr>
<td>ESTIMATED PROFIT (17.6%)</td>
<td>$5,502,500</td>
</tr>
</tbody>
</table>
Based upon the above analysis, the land-use plan is acceptable. However, the costs and revenue per phase should be analyzed for profitability and reasonable cash-flow requirements. Analyzing the phasing approach will determine if the developer can financially retain the estate lots for the developer’s own use.

Phase I

**Costs**

<table>
<thead>
<tr>
<th>Amount</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>$14,700,000</td>
<td>Vacant Land Purchase Price</td>
</tr>
<tr>
<td>$295,000</td>
<td>Design Team Professional Fees</td>
</tr>
<tr>
<td>$125,000</td>
<td>Regulatory Application and Escrow Fees</td>
</tr>
<tr>
<td>$1,040,000</td>
<td>Boulevard Construction Costs by the Developer</td>
</tr>
<tr>
<td>$540,000</td>
<td>Off-site Road Improvements ($800/lf)</td>
</tr>
<tr>
<td>$240,000</td>
<td>Traffic Signal Impact Fee</td>
</tr>
<tr>
<td>$300,000</td>
<td></td>
</tr>
<tr>
<td>$600,000</td>
<td>Entry Features</td>
</tr>
<tr>
<td>$550,000</td>
<td>Interest</td>
</tr>
<tr>
<td>$597,500</td>
<td>Real Estate Commission</td>
</tr>
<tr>
<td>$717,000</td>
<td>Overhead and General Administration Costs</td>
</tr>
<tr>
<td><strong>$19,164,500</strong></td>
<td>TOTAL PHASE I COSTS</td>
</tr>
</tbody>
</table>

**Revenue**

<table>
<thead>
<tr>
<th>Amount</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>$2,400,000</td>
<td>Commercial Live-Work 6 acres at $400,000/acre</td>
</tr>
<tr>
<td>$6,000,000</td>
<td>Business Park 20 acres at $300,000/acre</td>
</tr>
<tr>
<td>$3,550,000</td>
<td>Medium Density 70-ft-lot width 71 lots at $50,000/lot</td>
</tr>
<tr>
<td><strong>$11,950,000</strong></td>
<td>TOTAL PHASE I REVENUE</td>
</tr>
</tbody>
</table>

Phase II

**Costs**

<table>
<thead>
<tr>
<th>Amount</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>$780,000</td>
<td>Residential Collector (1,300 lf × $600/lf)</td>
</tr>
<tr>
<td>$65,000</td>
<td>Pedestrian Pathway System 8,000 lf × 6 ft × $12/sq yd</td>
</tr>
<tr>
<td>$2,500,000</td>
<td>Amenity Complex and Recreation Facilities</td>
</tr>
<tr>
<td>$1,800,000</td>
<td>Building 10,000 sq ft at $180/sq ft</td>
</tr>
<tr>
<td>$425,000</td>
<td>Site Work and Landscaping</td>
</tr>
</tbody>
</table>
Chapter 17 Case Study

$20,000 Playground Equipment
and Tot Lot

$200,000 Outdoor Pool and
Wading Pool; Deck

$30,000 Tennis Courts

$5,000 Volleyball Courts

$5,000 Bocci Courts

$15,000 Walking Track

$550,000 Interest

$610,000 Real Estate Commission

$732,000 Overhead and General Administration
Costs

$5,237,000 TOTAL PHASE II COSTS

Revenue

$3,520,000 High-Density Residential 88 units at $40,000/unit

$8,680,000 Medium Density 90-ft-lot width 124 lots at $70,000/lot

$12,200,000 TOTAL PHASE II REVENUE

Phases I and II Summary

$19,164,500 Total Phase I Costs

$5,237,000 Total Phase II Costs

$24,401,500 TOTAL COSTS Phases I & II

$11,950,000 Total Phase I Revenue

$12,200,000 Total Phase II Revenue

$24,150,000 TOTAL REVENUE Phase I & II

17.5 Summary

Based upon the cost and revenue summary for phases I and II, the land area allocated for low-density estate lots would have the following raw land cost basis:

Phase I and II Costs ($24,401,500) less Phase I and II Revenue ($24,150,000)

= $251,500.

$251,500 = $2,012/acre = $3,542/lot
The custom builder has orchestrated the design and approval process of a large-scale project having 125 acres comprised of 71 estate lots. The estate area would cost $2,012 per acre rather than the $60,000 per acre of vacant land zoned for one house per acre. The profit for the master developer would be in the build-out of the estate housing area.

The master developer will have to construct the residential road serving the estate lots. The infrastructure should be designed in phases, permitting the builder to proceed as the market demands. The builder receives overhead and administrative costs during the period of phases I and II parcel sales and construction.

The project should be considered a go if the developer chooses to sell all of the parcels, construct the core infrastructure, and is profitable. The return is 17.6 percent. This percent return will generally increase once the cash-flow analysis is completed for the life of the project. The developer must manage the design process to ensure the budgets are not compromised. Or, the developer may choose to retain the estate lots for the developer’s own use as a custom builder. The profit would be phased in over the build-out period of the estate area. However, the goal of the custom builder was to retain control over the lot supply available for the company’s own use as a custom builder. This land-use plan, master plan, and phasing program would achieve this goal.

For each land-plan alternative, a general pro forma should be prepared to assess the design program elements and land-use layout. However, if this land-use plan meets the project goals and is profitable, the developer could proceed to finalize the land-use plan for a regulatory submission before the due-diligence period has expired.

Successful projects require staying on time and within budget. Anyone can be a developer of large-scale projects. However, not everyone is an entrepreneur, nor will everyone take the risk. Developing property is a risk-reward industry. Understanding risk and the fundamentals of developing successful and profitable large-scale projects are essential tools in this business. All other traits are left up to you.

DISCUSSION TOPICS

1. What changes should be made to the land-use plan to achieve sustainability?
2. What other traffic-calming devices should be implemented in the infrastructure design?
3. What are the advantages and disadvantages of developing this project with the current zoning of one house per acre? What would be the estimated number of single-family lots based on one unit per acre?
4. Is the area planned for low-density estate lots the highest and best use for an area having topographic challenges and specimen trees?
Discussion Topics Reference Guide

Chapter 1

1. History of zoning and zoning principles
2. Stakeholder participation
3. Continuously update ordinances and design standards
4. More benefits than disadvantages: open space, impervious surface, and infrastructure
5. Building is a market-sensitive business

Chapter 2

1. Wetlands are nonbuildable areas; soil characteristics
2. Depending on the product and foundation design, steep slopes provide design character
3. Natural areas left as open space and views
4. Wetlands, floodplains, easements, open-space requirements reducing buildable area and thus reducing the number of units

Chapter 3

1. Important to obtain accurate field information to prepare land-use plan; information still has a value

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2. Drainage facilities, storm-water management, best management practices, earthwork, sewer, and building foundations
3. Define areas not suitable for development
4. Physical properties, views, and vegetation cannot be adequately displayed on plans; verify certain design considerations

Chapter 4
1. No. The sales price relates to the market and what price the market can afford
2. Residential: quicker production time and visible construction energizes the market
3. Arrange for focus groups to answer product, standard, and pricing questions
4. Build in phases and have flexibility in the regulatory process to change land uses

Chapter 5
1. Smaller lots and larger houses; connectivity
2. Market acceptance and regulatory standards
3. It is essential to the marketability of a project to have passive and active recreational uses incorporated in the overall community design. Creating a lifestyle and sense of community provides a marketing edge.
4. Reduces infrastructure costs, more units per acre reduces the vacant land price per unit

Chapter 6
1. Location, recreation amenities, security, aesthetic appearance of the site
2. Permits the buyers to move within the community and stay in the same area as their friends, services, and health-care facilities
3. Clubhouse for social activities, golf course, swimming pool, walking trails
4. Private roads, less water usage

Chapter 7
1. Advantages: located for ease of use upon build-out, provides grand entrance; Disadvantages: not located on main marketing window, cost of infrastructure to access amenity site
2. Land Planner: layout; Engineer: technical and regulatory input; Master Developer: project goals, community vision, orchestra leader
3. Decisive force to keep everyone on schedule and within budget
4. Essential to the sustainability of the community, creating a sense of belonging

Chapter 8
1. Market demands, sustainability, project marketing
2. Advantages: open-space amenity, recreation amenity, storm-water management facility, earthwork balancing; Disadvantages: requires over 100 acres, financial requirements for construction, ownership and maintenance responsibilities
3. Pavement alternatives, nature trails, community signage, landscaping
4. An absolute must to maintain aesthetic appearance of the community and sense of value; architectural appeal

Chapter 9
1. Arbitration.
2. Microsoft Project: user friendly; widespread use; requires constant updating; Primavera: powerful capabilities, versatility, not widespread use; special attention required for updating; By Hand: ease of use; still requires computer technology for dissemination.
3. Corps of Engineers: wetlands and Nation’s waterways.
4. Yes. Stringent enough to control aesthetic improvements to retain and enhance property values but flexible enough for individual decision making.

Chapter 10
1. Recordation of a final plat subdividing land-use parcels. Closings would be able to take place.
2. Submit quality plans, resolve outstanding issues, and use consultants with local experience.
3. Accelerated absorption rates will reduce interest carrying costs but accelerate expenditures, which may exceed financial arrangements.
4. Engineer the thread between all vested interest groups, which will have a direct affect on costs. Use a firm with local knowledge and expertise that matches the characteristics of the design complexities, i.e., storm-water management design.
Chapter 11

1. Land-use parcels should be smaller in acreage or number of housing units, smaller phases, and market flexibility.
2. Should be a visible entity; regulatory officials want to know the decision maker.
3. Yes. Meet as often as necessary to resolve issues.
4. Yes. Interpersonal skills are essential tools that must be used on a continuous basis—verbal tap dancing!

Chapter 12

1. Reserves more land in the land-use pods available for development purposes; value of the property will increase.
2. Roadway design, especially pavement width, create a hierarchy of road classifications suitable for the project.
3. Storm drainage, storm-water management, and best management practices.
4. Yes; slows the traffic down and provides for a better relationship with pedestrian traffic.

Chapter 13

1. Yes. Even if government does not require an impact study does not mean that the issue will not be a concern.
2. Preference should be given to negotiating a payment in lieu of the design and construction approach.
3. List benefits to the community, including uses and infrastructure improvements.
4. Disjointed development practices created the suburbs and lacks sustainability.

Chapter 14

1. Control architecture design.
2. Hire an outside management firm for a sense of impartiality.
3. Maintain excellent construction records and inspection reports.
4. Architectural control provides flexibility, but the control should include options but not freedom of design.
Chapter 15
1. High-intensity-amenity building complex and recreational facilities.
3. Road widths based on the classification of each road established specifically for the project.

Chapter 16
1. Traffic and school impacts.
2. Local ordinances are not structured for large-scale development approaches.
3. Should a developer of a successful large-scale project plan duplicate the same concepts in another marketplace? Why or why not. Yes. Name recognition of a successful project is a marketing plus.
4. What land-development engineering-design practices promote sustainability? Grading to limit cleared areas, design for pedestrians rather than vehicles, select quality material, control nonpoint-source pollution, and retain terrain characteristics.

Chapter 17
1. Land-use association for live-work and mixed-use opportunities.
2. Roundabouts, narrow roadways, sharp curves, shorter blocks.
3. Prepare a net buildable area and density analysis; associated costs and revenues to determine advantages and disadvantages of developing the site with the current zoning. 245 acres less 10% for steep slopes (25 acres) less 20% for right-of-way (50 acres) less 10% for storm-water management facilities (25 acres) less 10% open space (25 acres) = 120 acres of net buildable area or 120 single family lots.
4. A case could be made for high-density housing in multistory buildings with under-building parking may be the highest and best use.
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