5. Future Land Use and Transportation Framework

Introduction

This chapter of the Master Plan describes how the future land uses and transportation network in the Places29 area are structured to achieve a livable and desirable community. After giving a few definitions for important terms, the rest of the chapter is organized into three major sections:

1. The Land Use Framework section provides an overview of the future land uses, their distribution, structure and intensity. Specific topics covered are:
   - Definitions of the land use designations, including examples of the types of land uses that might be found in each designation.
   - The land use and transect tables and the relationship of existing and future land uses
   - A description of how to use the maps and tables, with an example
   - A description of the Future Land Use Framework Map
   - An introduction to land use intensity and urban form, including the Transect Map
   - Key subareas of the Framework Plan, including boundary expansions
   - Historical and Cultural Resources
   - A discussion of redevelopment and greenfield development, with information about the economics of redevelopment and opportunity sites for redevelopment in the Places29 area
   - An outline of areas for further study, specifically those that are recommended for Small Area Plans

2. The green infrastructure section addresses the open space network and related amenities, including:
   - A description of the Green Infrastructure Map
   - A listing of public open space, public parks, greenways, and blueways
   - An overview of semi-public open space, floodplains, stream buffers, buffers along US 29, and areas with steep slopes.

3. The future transportation network section outlines how the network is designed to provide convenient access to new and existing land uses and to provide a broad range of transportation choices to the area’s residents, workers, and visitors. Specifically, the section covers:
   - The projections and analysis that led to the transportation recommendations
A description of the future transportation network, including the Transportation Network Map

Details of the transit, bicycle, and pedestrian elements

Cross sections for key network roads

Standards for all other roads

Information on potential transportation improvements beyond 2025

Potential transit improvements

**Definitions**

Several terms are used throughout this chapter and are defined here:

- **Mixed Use**—Development contained within a single parcel or adjacent parcels that contains different uses that are complementary to each other and provide activity throughout the day. Uses can be mixed within a single structure (vertical mixed use), such as ground floor retail and upper floor residential, or by mixing individual single use buildings of varying uses on the same or adjacent sites (vertical mixed use).

- **Mixed Use Centers**—A cluster or district of that combines compatible and complementary uses (horizontally or vertically), such as residential, commercial, industrial, office, institutional, or other land uses in a walkable, pedestrian-oriented urban environment. Mixed use centers vary in scale and can range from solely neighborhood-serving uses

- **Single Use**—A building or parcel that accommodates only one type of use, such as residential, commercial, light industrial, etc.

- **Single Use Area**—A group of parcels that accommodates only one type of use, such as residential, commercial, light industrial, etc.

- **Place-making**—Refers to the act of designing and arranging buildings, streets, landscaping, and other elements of the community environment in a way that results in human-scaled, comfortable, functional, and memorable places that support and invite people to be active within the place.

- **Live/work Units**—A residential unit that is also used for commercial purposes, with a minimum of 50 percent of the total building area given to the commercial use within the same structure as the residential component.

- **Flex Space**—A building designed for a flexible range of employment uses which may include: administrative or other office space, Research & Development (R&D) uses, laboratories, and possibly small assembly or manufacturing areas that are associated with the R&D or other uses. The uses have relatively few impacts on surrounding properties. Nearly all traffic will be employee vehicles, with some customers and some delivery vehicles. These uses are attractive to many new and growing businesses that have changing needs as their businesses mature or react to
changing business market conditions. These uses mix very well with support service uses, such as retail, restaurants, drycleaners, and similar businesses.

- Urban Form (or Built Form)—The physical urban environment resulting from a combination of transportation infrastructure, buildings and other structures, parks and man-made open spaces.

**Land Use Framework**

The Land Use Framework section of the Master Plan defines the land use designations shown on the Future Land Use Framework Map (Figure 5.1 A and 5.1 B). This section provides an overview of the range of land use types allowable under each of the Framework designations. The Framework also describes and explains the distribution of land uses, their intensities, and the resulting patterns of community structure in the Places29 area.

The land use patterns shown on the Framework and Transect Maps, as well as the network of open spaces shown in the Green Infrastructure Map, are built on planning concepts outlined in the Neighborhood Model. The Land Use Framework is central to establishing the desired pattern of Centers and surrounding walkable areas. The Land Use Framework is closely linked to the enhanced network of open spaces and transportation facilities for the area. The transportation network consists of interconnected and multimodal roads, and includes routes parallel to US 29. This network of roads is an important prerequisite for Centers with an orientation other than toward US 29. The network of open spaces and public parks complements the higher intensity of land uses in the Land Use Framework and is essential to creating the livable urban environments envisioned by the Comprehensive Plan.

The following two sections provide definitions of the land use designations shown on the Framework Map and the types of land uses permitted in each Designation.

**Land Use Designations**

**Urban Mixed Use**

This framework designation is used in Centers and the Uptown. It includes a balanced mix of retail, housing, and office uses. The types of retail and services, as well as dwelling unit types, vary depending upon the type of Center or Neighborhood:

- **Primary uses:** retail, commercial, office, and a mix of residential types, with at least two different types of dwelling units.

- **Secondary uses:** open space and institutional uses are typically secondary in terms of land area, but are key to place-making within centers.

**Employment Mixed Use**

This framework designation is used in Centers and the Uptown. It includes a mix of uses with an emphasis on office, office/R&D flex, and other employment uses, as well as an increment of housing and retail.

- **Primary uses:** employment generators, including office, research & development (R&D), and light manufacturing (where appropriate); and retail and commercial that complement the employment uses.
Secondary uses: residential, open space and institutional uses with open space and institutional uses, which are key to place-making within centers.

**Commercial Mixed Use**

This framework designation is applied to areas around Centers. This designation is applied only to areas that are already developed or that have been approved for development as commercial shopping areas. The intent of the designation is to support the conversion of these areas to a more mixed-use character that will support adjacent mixed-use centers. These areas have the potential to integrate some nonretail uses, such as multi-family housing, office, or institutional uses, and develop a stronger linkage to an adjacent mixed-use center. In the future, as the Master Plan is updated, no new commercial mixed use is expected to be designated. Instead, retail and other commercial activities will be focused into the mixed-use centers.

Primary uses: commercial, retail, and office.

Secondary uses: research & development (R&D), residential, open space, and institutional uses with open space and institutional uses, which are key to place-making within these neighborhoods.

**Neighborhood Density Residential**

This designation is applied to areas where single-family detached and attached housing are desired with a gross density range of between 3 – 6 units per acre, and to existing residential areas with unit densities within or below this range. This framework designation is applied to areas around Centers.

Primary uses: single-family residential.

Secondary uses: retail, commercial, and office uses that are associated with live/work dwellings, and open space and institutional uses, which are key to place-making within these neighborhoods.

**Urban Density Residential**

This designation is applied where multifamily housing is desired with a gross density range of between 6.01 and 34 units per acre; and in existing residential areas with unit densities within this range. This framework designation is applied to areas around Centers.

Primary uses: multi-family and single-family residential.

Secondary uses: retail, commercial, and office uses that are associated with live/work dwellings, and open space and institutional uses, which are key to place-making within these neighborhoods.

**Office/Research & Development (R&D)/ Flex**

This designation allows for a range of employment generating uses and is applied to the majority of the nonretail employment areas within the Places29 area to create employment neighborhoods organized around Centers.

Primary uses: office and office | research & development / flex.
Secondary uses: retail and commercial uses that are associated with the primary uses in the neighborhood, and open space and institutional uses, which are key to place-making within these employment neighborhoods.

**Light Industrial**
This framework designation allows for a range of employment and commercial uses that are likely to create impacts that are not suitable for areas with residential uses or many types of office or research activities. This designation is applied to areas around Centers to create employment neighborhoods.

**Primary uses:** light manufacturing | storage | distribution

**Secondary uses:** incidental related offices and retail activities (particularly wholesale), and office | research & development flex, and other commercial that are associated with the primary uses in the neighborhood, larger auto commercial service uses, and open space and institutional uses, which are key to place-making within these employment neighborhoods.

**Heavy Industrial**
This designation allows for a range of employment and commercial uses that are likely to create impacts that are not suitable for areas with residential uses or many types of office or research activities, as well as light industrial uses. This designation is applied to areas around Centers to create employment neighborhoods.

**Primary uses:** heavy manufacturing | storage | distribution

**Secondary uses:** incidental related offices and retail activities (particularly wholesale), and office | research & development flex, and other commercial that are associated with the primary uses in the neighborhood, larger auto commercial service uses, and open space and institutional uses, which are key to place-making within these employment neighborhoods.

**Public Open Space**
This designation allows for a range of public recreation and open space uses. This designation is used in Civic Green Centers, other Centers, and Neighborhoods to provide for public activities. It is also used in combination with Semi-Private and other Open Space to define the edges of some neighborhoods.

**Primary uses:** public open space uses, such as: parks, greenways, trails, and other public open spaces.

**Secondary uses:** related institutional uses, which are key to place-making within the Places29 area.

**Semi-Public Open Space/Floodplain/Stream Buffer**
This designation includes open space that is owned and managed by private or semi-public entities, such as homeowners associations, private homeowners, commercial or business park land owners, and others. These areas consist of recreational and passive open space amenities, and may include floodplains, steep slopes, wetlands, and other areas with environmental constraints.
Primary uses: semi-public open space uses, such as: semi-public parks, greenways, trails, and other recreational and passive open spaces.

Secondary uses: related institutional uses, which are key to place-making within these open spaces and adjacent developed areas.

Land Use Types

The following lists are intended to be illustrative, not all-inclusive, of the land use types that fall within each of the land use designations defined above, listed in Tables LU 1, LU 2, and T 2. Some of the uses listed may require a special use permit.

Residential Uses

Single-Family Residential: This land use type consists of single-family homes with a gross density range of 3.01 to 10.0 dwelling units per acre, such as:

- Single-family detached homes with a variety of lot configurations
- Single-family attached home: duplex
- Townhomes/rowhouses
- Accessory apartments
- Rental cottages
- Manufactured houses

Multi-Family Urban Residential: This land use type consists of multi-family residences in a variety of configurations with a gross density range of 6.01 to 34 dwelling units per acre, including both ownership and rental units, such as:

- Triplex and quadriplex homes
- Townhomes and rowhouses
- Apartments/condominiums: garden, street-front “walk-ups,” and similar configurations
- Manufactured Houses
- Dwelling units above retail, office, and/or commercial uses

Multi-Family Core Residential: This land use type consists of multi-family residences in a variety of configurations with a gross density range of 34.01 to 80 dwelling units per acre, including both ownership and rental units, such as:

- Townhomes and rowhouses.
- Apartments/condominiums: street-front “walk-ups”, mid-rise, and similar configurations
- Dwelling units above retail, office, and/or commercial uses
Commercial and Employment Uses

**Neighborhood Retail:** Businesses are intended to draw a significant portion of their clientele from the surrounding neighborhood. Many customers or clients could walk to the business. These businesses may be clustered. Examples include:

- Local retail, such as florist, newsstand, or other similar uses
- Small restaurant or café, or similar businesses serving prepared food and beverages
- Small food sales businesses, such as bakery, deli, butcher, or other similar uses
- Convenience store
- Small pharmacy or drug store
- Personal retail service, such as hair salon, barber shop, dry cleaner/laundry, laundromat, tailor, seamstress, and similar uses

**Community & Regional Retail:** Retail businesses that serve a wider market than a single neighborhood, so the majority of their customers will drive (or take transit) to them. Generally, these businesses are also larger than Neighborhood Retail uses. Groups of retail businesses may cluster with smaller neighborhood-scale retail businesses into a shopping center or along a retail street and form the nucleus of a commercial neighborhood. Examples include:

- Grocery store
- Pharmacy or drug store
- Department store
- Clothing, book, antiques, gifts, jewelry, crafts, or other specialty retail business
- Hardware store
- Furniture, home appliance, and other household good sales and service
- Farmers’ market
- Restaurant, café, and other businesses serving prepared food and beverages.
- Feed and seed stores
- Retail nurseries and greenhouses
- “Big box” stores: home improvement/builders’ supply, office supply, department or general retail, and other retail uses that are 75,000 square feet or larger.

**General Commercial Service:** These are service businesses open to the general public that rely on customers visiting the business, not primarily retail uses or office uses (with the exception of medical offices). Examples include:
- Entertainment, such as cinemas, theatres, video arcades, night clubs, or similar uses
- Hotel, motel, inn, or bed and breakfast
- Indoor athletic facilities, including: ice skating rinks, laser-tag facilities
- Recreation establishments, such as: bowling alleys and pool halls
- Health spas
- Medical offices, including dental, medical, optical, and other similar uses with significant numbers of visitors
- Financial institutions, such as banks, savings and loans, and credit unions.
- Day care, child care, nursery
- Reproduction and mailing services
- Funeral homes and crematories
- Veterinary office and hospital, kennel, animal shelter
- Auction houses
- Printing and publishing

**Auto Commercial Service:** These are the auto-oriented commercial uses that require a higher level of site control because of their tendency to create pedestrian-unfriendly environments. Examples include:

- Automobile, truck, recreational vehicle, and boat sales
- Automobile, truck, recreational vehicle, and boat rentals
- Vehicle sales and service, including automobiles, repair, and carwash
- Automobile service station
- Auto body shop (fully contained in a building with appropriate ventilation and other environmental controls)

**Office:** These are primarily employment uses relying on limited numbers of customer visits. Examples include:

- Professional offices: medical, legal, architectural, engineering, accounting, and other similar professional businesses
- Administrative and business offices, including software design and other hi-tech related businesses not requiring laboratory or assembly facilities
- Call centers and data processing services
• Small conference facilities for use by on-site businesses

**Office | Research & Development (R&D) Flex:** These uses are examples of the “new” industry, with relatively few impacts on surrounding properties, except for possible traffic issues. Nearly all traffic will be employee vehicles, with some customers and some delivery vehicles. Businesses that require a significant number of deliveries by semi-trailer are to be considered light industrial uses. These uses mix very well with support service uses, such as retail, restaurants, drycleaners, and similar businesses. Examples include:

• Research laboratories (both wet and dry)

• Offices

• Assembly and fabrication facilities (all indoors, with no external noise, odor, or other nuisance impacts)

• Showroom and small conference facilities for use by on-site businesses

• Flex space that can shift between the various uses allowed in this land use type

**Light Manufacturing | Storage | Distribution:** These uses have some traffic impacts, but little or no noise, fumes, or vibration impacts. In some instances, materials used may be hazardous, requiring the segregation of that use. Examples include:

• Light manufacturing and assembly, such as: jewelry, musical instruments; surgical, medical, and dental instruments and supplies

• Auto body shops (not fully contained in a building)

• Compounding of drugs

• Mini-storage warehouses

• Accessory storage and distribution facilities that may be enclosed or in rear yards

**Heavy Manufacturing | Storage | Distribution:** These are heavy industrial uses that, because of traffic impacts (particularly from larger and frequent truck access), and possibly noise, fumes, and vibration, will need to be segregated from other uses. Examples include:

• Manufacture, processing, fabrication, assembly, distribution of products

• Engineering, engineering design, assembly, and fabrication of machinery and components that may involve: machining, babbiting, welding, and sheet metal work

• Concrete and brick manufacturing, and sand and gravel distribution facilities

• Dry cleaning plants

• Concrete mixing plant, storage, distribution

• Machine shops, tool and die, blacksmithing, boiler shops, and similar
- Manufacture of building components
- Sawmills, planing mills, wood preserving operations, woodyards
- Contractors’ storage yards
- Towing and storage of motor vehicles
- Accessory storage and distribution facilities

**Warehousing/Distribution:** These are businesses that rely on semi-trailer trucks to deliver and pick up goods, so these businesses need to be segregated from businesses without this requirement. Examples include:

- Moving businesses, including storage facilities (except mini-storage warehouses)
- Regional or bulk warehouse facilities
- Heavy or refrigerated distribution facilities
- Truck terminals
- Air cargo storage and distribution facilities

**Civic Uses**

**Institutional:** These are public and private facilities, offices, and related facilities; and land reserves for future such facilities. Examples include:

- Public Facilities, such as: schools, community centers
- Private Facilities, such as: educational, technical, fine arts, and trade schools; places of worship; community center; club, lodge, civic, and fraternal facilities
- Hospitals, nursing homes, assisted living facilities, and convalescent homes

**Open Space:** These are generally undeveloped areas for recreational, visual, and preservation purposes. These are areas owned and managed by a public or private entity, including homeowners associations (HOAs). Examples include:

- Public, semi-private, or private park or recreational fields
- Greenways and blueways
- Trails and paths

**Land Use and Transect Tables**

This section of the Master Plan contains a series of tables that provide specific information about allowed and conditional land uses and development standards required for specific land use types. The content of the land use and transect tables is intended to encourage development in the Places29 area to take on a mix of uses and an urban form that supports the development character,
transportation, and environmental goals outlined in the Vision and Guiding Principles. The Land Use Tables LU1 and LU2, and the Transect Table T2 address on the following key areas:

- Mix of uses within Framework designations
- Building size and footprint requirements
- Retail commercial size and specific use requirements
- Limitations regarding the business practices of some key uses
- Definition of key elements of urban form (height, ground floor use)

The following discussion of the intent and logic of these development standards, along with the Unified Design Guidelines, provides a framework for evaluating and conditioning uses that fall within the conditional use requirements defined in Tables LU1, LU2, and T2.

**Mix of Uses within Framework Designations**

The Master Plan defines a range of required, allowed, and conditional land use types, intensities, and sizes for each framework designation. These requirements are proposed to ensure that uses within each designation complement each other and achieve the purpose of the designation. For example, lower intensity employment uses and auto commercial service uses are not allowed in either the urban mixed use or employment mixed use portions of the Uptown, because these uses do not support the more active and urban character that is desired for the Uptown. At the same time, these uses are allowed relatively close to the Uptown in nearby Centers and Light Industrial and Office | R&D Flex designated areas.

Similarly, there are distinctions in the two types of Neighborhood Centers that are defined in the Master Plan: urban mixed use and employment mixed use. Urban mixed use Neighborhood Centers are required to have multi-family urban residential and neighborhood retail land uses, with a broad range of other uses allowed. Employment mixed use Neighborhood Centers are also required to have office uses and are allowed some additional employment uses. The first requirement to include multi-family and neighborhood retail uses supports the goal of Neighborhood Centers—to provide a dynamic mixed-use environment that provides for the needs of those who live or work in the center and the surrounding neighborhood. The increased range of land uses within an employment mixed use Neighborhood Center reflects the character of the surrounding employment neighborhood. The larger range of uses also provides an additional housing choice for those who are attracted to a more active working environment, possibly in the form of live/work lofts and other housing choices. Conversely, the limitations on auto commercial service uses and other employment uses within the urban mixed use Neighborhood Centers protect surrounding residential neighborhoods from uses that are more likely to create nuisance, noise, or truck traffic.

**Building Size and Footprint Requirements**

The land use tables define a maximum building footprint or single use size for several land use types in particular framework designations. Requirements for specific retail commercial uses are discussed below. The primary reason for these limitations is to support the desired circulation network and block size as defined in the Unified Development Guidelines (see Chapter 7 – Unified Design Guidelines). Single buildings should not be so large that they become a barrier to pedestrian circulation, particularly within mixed-use centers. Note that the size requirements are
smallest in the urban mixed-use Neighborhood Service Center designation, which complements the finer-grained character of the residential neighborhoods that surround these centers. Standards allow larger sizes in Destination Centers and employment uses, which reflect both the types of uses that surround these areas and the fact that pedestrian and bicycle accessibility is not as heavily weighted in these employment areas compared with residential neighborhoods. Yet, in the most intensive part of the Places29 area, the Uptown, the desired building footprint sizes are somewhat smaller, as pedestrian circulation is a very high priority in the Uptown. The Uptown is similar to the walkable and fine-grained building, block, and pedestrian circulation pattern of Downtown Charlottesville.

**Retail Commercial Size and Specific Use Requirements**

As discussed above, one reason to limit the size of retail commercial building footprints is to support the development of a finer-grained circulation network. There are additional reasons for defining a desirable maximum size for retail commercial buildings or uses in some framework categories. These are related to the desired function and urban design quality of particular places within the Places29 area. For example, the community and regional retail land use type is allowed as a conditional use for grocery stores of up to 15,000 sq. ft. in Neighborhood Service Centers. This requirement was determined by the desire to encourage grocery stores to locate in Community or Destination Centers as they typically draw from a larger market area than a single or a small group of neighborhoods. Yet, it is possible that a smaller-sized grocery store would be economically feasible within Places29, and that such a store could be integrated into a Neighborhood Service Center without dominating the center or resulting in undesirable levels of traffic.

Similarly, the size of single-building footprints in Community and Destination Centers is also restricted, with a maximum area beyond which the building configuration requires conditional approval. This is done to support the desired urban design character of these centers and to encourage the construction of multi-level retail buildings for larger retailers. The combination of defining the extent of retail commercial capacity within Places29, defining the maximum desirable building footprints, and providing guidelines for site and building design, creates an environment that encourages the development of more creative and higher-quality retail and commercial uses.

In addition to grocery stores, there are other uses with special requirements that require treating them as a conditional use. For example, auto commercial service businesses are required to serve the needs of Albemarle County residents and workers. The US 29 corridor has areas where these uses are provided for today, and, given the high level of regional access to the Places29 area, this is a logical location for auto service and sales activities. However, these uses can easily conflict with the pedestrian environment that is desired in mixed-use centers, and they can be disruptive to the neighborhood character desired in the Neighborhood Service Centers and the residential neighborhoods that surround them. For these reasons, there are standards in the land use tables to limit the maximum size of single auto commercial service uses in the mixed use centers, in addition to limitations on activities that could be a nuisance to adjacent uses. The strong market for auto service uses in the area means that more flexibility is needed for auto commercial businesses in the Commercial Mixed Use, Light Industrial, or Heavy Industrial designations.

**Limitations Regarding the Business Practices of Some Key Uses**

There are some conditional uses defined in Tables LU1 and LU2 that have criteria related to business practices and site configuration issues. These are due to potential conflicts with
surrounding uses and the potential for negative impacts on the pedestrian and urban character of centers and neighborhoods.

Accessory Uses: Some framework designations condition retail and commercial uses to be secondary to another primary use; these primary uses are the focus of the framework designation. This allows for a small amount of development within an area to accommodate these secondary uses and protects the predominant character defined by the primary use. For example, neighborhood retail and general commercial service uses are conditionally allowed in the Office | R&D framework designation, if they are accessory to an office | R&D use. This is also the case for retail and general commercial uses in the Light and Heavy Industrial designations. Similarly, neighborhood retail, general commercial service, and office uses are conditional in the Urban Density and Neighborhood Density Residential designations, if they are associated with a live/work residence.

Protection from Nuisance Effects: Another set of uses is conditioned so that noise, odor, and other potential nuisances will not adversely affect the primary or surrounding uses. Examples of this include auto commercial uses and light manufacturing | storage | distribution uses. Typical operating requirements (if allowed by right) or conditions of approval would include requiring that potential nuisance activities will occur within buildings, restricting hours of operations, and, in some cases, implementing an on-going monitoring and reporting process.

Protection from Potential Visual and Other Urban Character Effects: Some uses rely on storage yards or parking lots that are used for storage of vehicles (e.g., auto sales and service uses). Again, these uses are conditional in some designations where the urban character is pedestrian-oriented and creates value for adjacent development. In these cases, conditions of approval may include buffering or screening with landscaping or moving activities into buildings.
Relationship of Existing and Future Uses

Existing Residential Areas

The overall goal for existing residential areas within the Places29 area is to protect and enhance them. With few exceptions, existing residential uses have the same designation in the Framework Map as they do in the 1996 Land Use Plan. Limited exceptions occur with the intent to create a better fit with the pattern of new land uses surrounding such existing residential areas. It is expected that changes from the existing type of use to that designated under the Master Plan will occur as part of changes driven by the real estate market.

Existing Commercial Areas

The Community, Industrial, and Regional Service designations of the County’s 1996 Land Use Plan that dominate much of the length of US 29 have been modified in the Framework Map to accommodate mixed use centers and uses oriented toward them, thus forming new Neighborhoods and enhancing existing Neighborhoods. Aside from undeveloped areas, such as those on either side of US 29 south of Hollymead and north of the South Fork of the Rivanna River, much of this transformation will occur through redevelopment. This process will shape the future development south of Woodbrook Road and towards the area around Greenbrier Drive and Hydraulic Road. These areas of the County are expected to see similar reconfigurations of use over time. Areas of the former Community, Industrial, and Regional Service designations not converted to mixed use centers have been designated as Commercial Mixed Use.

How to Use the Maps and Tables in this Chapter

The Framework Map, Transect Map, and Green Infrastructure Map should be used together in order to understand the desired community structure for Places29. Together with the Land Use and Transect Tables, the maps provide the information needed to determine what land use types and land use intensities are permitted in a given location.

The following terms are used in Tables LU1 and LU2 and defined as follows:

- Required Use—Type of use and/or use intensity mandatory as per the Framework designation.

- Allowed Use—Type of use and/or use intensity permissible as per the Framework designation with standard administrative review.

- Conditional Use—Type or intensity of use that is only allowed if specific conditions are met and/or tied to discretionary site plan review.

Both the maps and the tables give county staff, developers, property owners, elected officials, and the public the determine land use types and intensities by following four steps:

Step 1: Use the Framework Map to determine which Land Use designation is assigned to a specific property and whether it is located in a Center, in the area around a Center, or in the Uptown. If the property is located in a Center, the Center’s Type (Neighborhood Service, Community, or Destination) also needs to be noted.

Step 2: Use the appropriate Framework Land Use Table to determine which type of land uses may be required, allowed, or conditional within a given Land Use designation. Use
Table LU1 for property locations in Centers and the Uptown, and Table LU2 for uses around Centers. In some cases, land uses may be required only for properties larger than a certain size. Other conditions may include maximum sizes (in square feet) for a use or building floorplate.

It is critical to use the correct land use table—the one that corresponds to the Framework Designation and Center Type identified in Step 1, since there are different designations and conditions for uses in Centers and the Uptown, and Land Uses Organized Around Centers.

Step 3: Use the Transect Map to determine which Northern Development Areas Transect Zone (NDT) the property is located in (NDT 1 through NDT 6). Then, refer to the Transect Table T2 to identify the final intensity level (number of dwelling units per acre for residential uses or Floor Area Ratio for commercial and employment uses) at which the required, allowed, or conditional use can be built. The Transect Table also provides information regarding the allowed height of buildings by use.

Step 4: Refer to the Green Infrastructure Map to determine whether a Civic Green Center may be required on or near the subject property. Whether a Civic Green Center will be required as part of development on the subject property depends on the size of the individual property or overall project (which may involve a number of properties), and the proximity of the property to a mixed-use center.

The Green Infrastructure Map also provides information about applicable stream buffers, clusters or contiguous areas of slopes steeper than 25%, and existing or proposed Greenways, bicycling facilities, and trails.

After completing the steps above, the applicant should refer to the Unified Design Guidelines (Chapter 7) to determine what other standards and guidelines apply to the site design and other physical aspects of developing the property.

Example of how to use the Master Plan Maps and Tables
The following demonstrates how to use the maps and tables for a sample property located just west of US 29 along Hollymead Drive Extended:

Step 1: The Framework Map shows that this property is designated Urban Mixed Use and is located inside of a Center, in this case a Neighborhood Service Center;

Step 2: The Framework Land Use Table for “Land Uses in Centers” lists the following types of land uses as appropriate for Urban Mixed Use in a Neighborhood Service Center:

The table provides an overview of required, allowed, and conditional types of land uses permissible at the specific location. For conditional uses, the table also states under what conditions a particular use is possible (addresses use conditions only, i.e., size limits or minimums). It does not, however, give the allowable density or intensity of use, which is determined in Step 3.

Step 3: The Transect Map shows that the property is located in Transect Zone NDT 5. The Transect table identifies the following intensity levels for the permissible uses on this property.
Note that for the Single-Family Residential land use type, a minimum density of 6 units per acre is given rather than 3.01 (the low end of the allowed range for this land use). The minimum density was raised to 6 for NDT5 (Urban Center) to create a relatively higher intensity of development in this transect zone. Similarly, the minimum density for Multi-family Residential is 18 du/acre rather than 6 du/acre (the low end of this land use’s density range). Without these minimums, the envisioned urban character of a Neighborhood Service Center could not be achieved.

Step 4: The Green Infrastructure Map indicates that a Green Civic Center is not required near this area, since the Neighborhood Service Center is nearby. Bicycle lanes are proposed for Hollymead Drive Extended.

Description of the Future Land Use Framework Map

The Future Land Use Framework Map (see Figures 5.1 A and 5.1 B) defines the land use pattern and neighborhood structure for the Places29 area. It is expected that the development capacity—the full implementation of the illustrated land use pattern and neighborhood structure—will occur many years or even decades after 2025.

SIDEBAR DESCRIBING DEVELOPMENT CAPACITY OF LAND USE FRAMEWORK

This plan distinguishes between growth projected to occur by the year 2025 and the potential development capacity of the Places29 area to accommodate land uses designated in the Framework Plan.

2025 Growth Projections: The traffic analysis conducted for this plan takes into account the growth projections for the Charlottesville/Northern Albemarle area as established by the 2025 regional growth allocation from the state demographer. The projected growth between the base year for this plan (2005) and the year 2025 are listed in Table 5.1 below. The majority of the projected growth will occur in already approved projects, with the remaining growth assumed to occur in areas surrounding these ongoing developments.

Potential Capacity: Currently, no exact predictions can be made about growth rates and the spatial allocation of growth in the Places29 area beyond the 2025 time horizon. However, using the Land Use Framework and the Transect, the potential development capacity, which is the capacity of an area of land to

1 The boundaries of land use categories shown on the Framework Map were delineated using the following approach:

1. In Neighborhoods 1 and 2, where existing land uses dominate and future development will occur primarily as redevelopment, existing property lines were used to delineate future land uses to the greatest extent possible. Only in the “Four Quadrants” of the Rio Road/US 29 area was stronger consideration given to the resulting shape of the Center than to specific property lines.

2. North of the South Fork of the Rivanna, the boundaries in areas with (largely) “greenfield” development were determined by using criteria related to the desired Center size, the one-quarter to one-half mile walkable areas around Centers, and natural features such as stream valleys, ridges, and other natural edges. The Framework Categories assigned to existing residential neighborhoods, such as Forest lakes, Airport Acres and others coincides with those of the current County Comprehensive Plan.

3. For areas with already adopted zoning map amendments and/or approved site plans, the overall boundaries of these plans were taken into account. Land uses shown within these boundaries allow for the development of previously approved land use programs, but may suggest modifications to their distribution on the site and/or a more intense set of uses.
accommodate a designated land use, can be calculated. The calculations of potential development capacity for the Places29 area take into account the range of intensities and the mix of uses that are allowed within the different land use designations shown on the Framework Map. Table 5.1 lists the possible range of potential development capacities for employment and residential land uses in the Places29 area.

It should be noted that it is unlikely that future development will consistently occur at the highest or lowest end of the range. So, it is very unlikely that the extreme lower or higher ends of the range will be the result of development beyond 2025.

### Table 5.1: Summary of Existing, 2025 projected, Development Capacity numbers for Residential Units and Employment in the Places29 area

<table>
<thead>
<tr>
<th></th>
<th>Dwelling Units</th>
<th>Dwelling Units Change</th>
<th>Employment</th>
<th>Employment Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Existing (2005)</td>
<td>14,200</td>
<td>---</td>
<td>15,900</td>
<td>---</td>
</tr>
<tr>
<td>Projected 2025</td>
<td>21,000</td>
<td>48%</td>
<td>40,900</td>
<td>157%</td>
</tr>
<tr>
<td>Development Capacity</td>
<td>37,900</td>
<td>167%</td>
<td>127,200</td>
<td>700%</td>
</tr>
</tbody>
</table>

The Land Use Framework follows the principles of the Neighborhood Model and organizes new development and major redevelopment to include a pattern of mixed-use centers with surrounding land uses oriented toward the Centers. In general, the desired pattern of development would result in all land in the Development Areas being within 1/4 to 1/2 mile of a Center. Established suburban neighborhoods like Forest Lakes, Raintree, Dunlora, Woodbrook, and others retain their current land use pattern and do not include new mixed-use centers. However, all new development and major redevelopment will be located within one-quarter to one-half mile of either a Center (Civic Green, Neighborhood Service, Community, or Destination) or the Uptown.

### Distribution of Mixed Use Centers

The distribution of Centers on the Framework Map follows the intent of the Neighborhood Model and recommendations received from the public and stakeholders. The public has expressed a preference for the majority of Centers to be oriented toward roads that are perpendicular or parallel to US 29. This distribution is also consistent with two major recommendations in the US 29 North Corridor Transportation Study: first, to develop a roadway network that encourages local trips to occur on parallel routes rather than US 29 and, second, to employ access management strategies that orient the access of properties along US 29 to those parallel and perpendicular roads. The extent and distribution of Centers is also supported by the market analysis performed as a part of Places29.

Neighborhood Service Centers are spaced along major roadways, such as Rio Road East, Rio Road West/Hydraulic Road, Lewis and Clark Drive, and Berkmar Drive (Extended), in order to provide increased pedestrian and bicycle access to everyday goods and services offered in these Centers. These locations are also well-located from a market perspective, as the Centers have a visual and physical relationship with these major roads making them accessible to additional clientele from outside the immediate neighborhood. The locations of Neighborhood Service Centers were determined by both the availability of opportunity sites (vacant or underutilized
properties) and the concept of distributing these Centers to maximize their accessibility. The
spacing of the Centers also allows them to have a relationship to potential transit stop locations.

There are two concentrations of Community and Destination Centers on the Framework Map. One is located around the intersection of Rio Road and US 29. The second is the large area that includes the Hollymead Town Center, the proposed North Pointe development, and several other Centers around the intersection of Airport Road and US 29. This second area also includes the Uptown. Several of the Centers in this second area are the result of development that is now underway (Hollymead Town Center) or has been approved (North Pointe). The Framework Map’s land use and Center designations for both areas are consistent with already approved plans. Designating these as mixed-use centers will guide development toward a stronger integration of Centers with the surrounding residential and employment neighborhoods. The intent is to enhance the qualities of existing or approved development. The concentration of Community and Destination Centers at the intersection of Rio Road and US 29 reflects the area’s existing retail function and the concentration of opportunity sites for major redevelopment.

Employment Mixed Use Neighborhood Service Centers are located at the intersection of Dickerson Road and Towncenter Drive, in Piney Mountain, at the southwestern corner of the US 29 and Airport Road intersection, and on Lewis and Clark Drive in the UVA Research Park. Some of these centers combine Urban Mixed Use and Employment Mixed Use. These Centers will serve employees whose workplaces are within walking distance of a Center. The Centers will not only provide cafes and restaurants that cater to employees at lunchtime, but also provide opportunities to shop for daily needs. The combination of employee activities associated with the Center will help to reduce the need for additional trips by car.

Civic Green Centers are not shown on the Framework Map, as their specific location is flexible to best fit in with future development proposals (also see Chapter 4 – Place Types – Defining the Walking Shed of Centers). However, approximate locations for Civic Green Centers are included on the Green Infrastructure Map (Figure 5.29 A and 5.29 B). In general, a Civic Green Center is required for areas that are designated for development, but that are not located within one-quarter mile of a mixed-use center (Neighborhood Service, Community, Destination, or the Uptown). The location and spacing of Civic Green Centers will depend on the walking sheds of adjacent Civic Green and mixed-use centers.

**Distribution of Other Uses Outside Centers**

The following addresses the distribution of uses located outside of Centers.

**Residential Uses**

In general, new residential uses outside of Centers are located around new mixed-use centers to create walkable residential neighborhoods (this approach is most clearly visible on the Framework Map in the areas north of the South Fork of the Rivanna). Locating residential uses around centers is a central component of the Neighborhood Model as it locates residences within walking distance (a 5- to 10-minute walk) of a mixed-use center that provides neighborhood-serving uses. The mixed-use center, in turn, depends on the residential areas for a customer base. The densities allowed under the urban density residential designation not only maximize the number of people benefiting from the proximity of centers, but also increases the economic viability of the centers and helps provide a range of housing choices.
Neighborhood 1
Residential uses in this Development Area generally follow patterns established by existing residential uses at densities largely consistent with those assigned to the same areas in the current Comprehensive Plan. New residential areas have been designated in the vicinity of Agnor-Hurt Elementary School and along the northern end of Berkmar Drive (Extended) to create opportunities for residential development around the Centers in the area.

Neighborhood 2
Similar to Neighborhood 1, the distribution of residential uses in Neighborhood 2 follows the established pattern of existing and proposed residential development. East of the railroad, the pattern reflects land use recommendations form the Meadow Creek Parkway, Final Report, with urban density residential areas oriented toward a future Neighborhood Service Center and new open spaces along the proposed Parkway alignment. An area of urban density residential north of Belvedere should only be implemented after the feasibility and alignment of a future Northern Free State Road has been conducted.

Hollymead
The Land Use Framework maintains existing residential neighborhoods with their current Neighborhood or Urban Density Residential designations, such as Forest Lakes, Deerwood, Airport Acres, and others. The distribution and designation of new residential uses surrounds the developing and new mixed-use centers in the area with Urban Density Residential and—farther out from the Centers—with Neighborhood Density Residential. Neighborhood residential uses are primarily targeted to areas along the Development Area boundaries and areas of more challenging topographic terrain. The Urban Density Residential area shown in the University of Virginia Research Park is consistent with long-term development goals of the UVA Foundation and relates well to the location of the Urban Mixed Use/Employment Mixed Use Neighborhood Service Center on Lewis and Clark Drive.

Piney Mountain
Residential areas west of US 29 consist of the existing developments of Briarwood and Camelot. East of US 29 Urban Density Residential uses are located around the Neighborhood Service Center and transition to Neighborhood Density Residential toward the Development Area boundary.

Urban Mixed Use

Urban Mixed Use Outside of Mixed Use Centers
Urban Mixed Use is designated outside of Centers adjacent to a number of Neighborhood Service Centers, along portions of Berkmar Drive north of Agnor-Hurt Elementary School, and—most prominently—around the Neighborhood Service Center in the southwestern quadrant of the US 29/Rio Road intersection.

1. Urban Mixed Use areas adjacent to but outside of Neighborhood Service Centers are designated to allow for a continuation of the mixed-use fabric, but with more flexibility in the size of Office and Auto Commercial Service uses\(^2\). The size of Neighborhood Retail types, on the other hand, is more restricted in Urban Mixed Use outside of Centers.

\(^2\) These are comparable to what is allowed under the Employment Mixed Use designation in Neighborhood Service Centers.
in order to provide incentives for its location inside of Centers. In particular, this is intended to promote the location of grocery stores inside of Centers.

2. Existing (horizontal) mixed use development along Berkmar Drive has already begun to establish a basic pattern of Urban Mixed Use in this location. The designation formalizes this land use pattern, while adding a higher level of residential uses throughout the area. Both, the Community Center to the east and the recreational facilities at Agnor-Hurt Elementary School serve as focal points for the area.

3. Urban Mixed Use in the southwestern quadrant of the US 29/Rio Road intersection is part of the Mixed Use Neighborhood\(^3\) in this portion of the Midtown. Also see the section Key Subareas of the Framework Map below for further discussion of the Mixed Use Neighborhood and the Midtown.

**Commercial Mixed Use**

All areas designated Commercial Mixed Use on the Framework Map are related to existing or already approved commercial development. Today, these areas consist of Community, Industrial, and Regional Service designations, such as strip malls, big box development, and other commercial development at a variety of scales. An important aspect of the redesignation to Commercial Mixed Use is the intended long-term transformation of single-use commercial areas into Commercial Mixed Use areas that include residential uses. In order for this integration to be successful, high quality site design will be required. The integration of residential uses as a component of Commercial Mixed Use development only applies to development proposals on sites larger than 5 acres in size.

**Employment Uses**

*Neighborhoods 1 and 2*

While the balance of employment uses\(^4\) are located in the area north of the South Fork of the Rivanna, the area south of the river still provides opportunities for employment uses located in proximity to the substantial residential areas in Neighborhoods 1 and 2. The distribution of employment uses south of the South Fork of the Rivanna largely follows the pattern already established by existing uses in the Office|R&D designation, such as Sperry Marine, the Comdial Site, and a variety of smaller areas along Greenbrier Drive, Rio Road, and Berkmar Drive. The Framework Map shows a concentrated cluster of Office|R&D in the Greenbrier Drive area. The majority of Office|R&D is located along US 29, Cedar Hill Extended, and Berkmar Drive Extended.

*Hollymead*

With the exception of a small area in the proposed North Pointe development, all employment uses in Hollymead are located west of US 29, where they form three different zones that are primarily of one specific Framework designation:

1. Office | R&D related employment is clustered throughout the University of Virginia Research Park and significant portions of the Uptown.

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\(^3\) See Chapter 4 – Place Types for a definition of Mixed Use Neighborhood.

\(^4\) Employment uses include Office|R&D, Light Industrial, and Heavy Industrial uses.
2. Light Industrial uses are located in two larger subareas along the Dickerson Road corridor. The first subarea is located between the Research Park and the Airport, the second, larger area is east of Dickerson Road and south of Towncenter Drive.

3. Heavy Industrial Uses are focused in the Northside Industrial Park.

A smaller area south of Airport Road and west of US 29 combines Light Industrial and Office | R&D uses.

This clustering of employment will make Central and Northern Hollymead, west of US 29 a major employment center. Airport Road, Dickerson Road, and Lewis & Clark Drive will serve as major access roads for these uses.

**Piney Mountain**

Approximately 28.7 percent of the land area designated as employment uses in Piney Mountain falls into the Office|R&D land use designation. This makes Piney Mountain, along with central and northern Hollymead, a major place for employment in the Places29 area.

**Civic Uses**

It is expected that the County will build a new elementary school in the North Pointe development. Another site in this development has been proffered for a public library.\(^5\)

**Public Open Space**

Public open spaces and Greenways are discussed in the Green Infrastructure section of this chapter.

**Land Use Intensity and Urban Form**

The concept of the Transect was introduced with the Neighborhood Model and has been adapted for use in the Northern Development Areas. The Transect Map (Figures 5.2 A and 5.2 B) and Table T2 regulate both the intensity of land uses as well as key aspects of the desired urban form of future development.

**Land Use Intensity**

The Transect regulates the intensity of allowable land uses—dwelling units per acre for residential uses and floor area ratios for nonresidential uses—relative to the location of a parcel within the Places29 area. The Master Plan’s requirements with regard to the density and intensity of allowable uses are contained in the Transect Map (Figures 5.2 A and 5.2 B) and the Transect Tables (T1 and T2). Together, the map and tables indicate allowed densities for residential uses and intensities for nonresidential uses in each of the Transect Zones (also see the section *How to use the Maps and Tables* in this chapter).

**Definition of Urban Form**

The Transect Map and Table T2 also establish a critical link between the land use designations in the land use Tables LU1 and LU2 and the built form desired for the various place types in the Places29 area. Built form relates to the physical qualities of a building and its site, such as the

\(^5\) Also see Chapter 6 – Community Facilities and Services.
number of stories, setbacks, building footprint, orientation of entries, ground floor use and upper floor use, and others. While most of the desired physical characteristics of future development is described in the Unified Design Guidelines (see Chapter 7). Table T2 contains requirements for building height and number of floors per use that are critical for determining the desired urban form.

Building height is related to the intensity of development and the urban form of a place; when building height is considered in conjunction with street width and setbacks (see the sidebar regarding building height and urban enclosure). Given the land use intensity and urban design goals for the Master Plan, Table T2 defines a range of building height standards for the land use types that vary by transect zone, with building heights generally increasing from the Urban Edge (NDT-3) to Urban Core (NDT-6). Building heights given in the table relate to allowable maximums as well as required minimums in number of stories.

**Building Height and Urban Enclosure “Sidebar”**

A pedestrian’s sense of visual enclosure and relationship to surrounding building activity is an important urban design element used to create the experience of being in an active urban place that is comfortable for pedestrians. The threshold where a pedestrian first perceives enclosure is a 1:4 ratio of building height to combined street and setback width; this is more typical of lower intensity suburban environments or locations where urban centers “side-on” to major roadways. In places like the mixed use centers in the Northern Development Areas, where a more urbane environment is desired, height-to-width ratios of between 1:3 and 1:2 create a more appropriate enclosure. In very urban places, like the Uptown, the ratio may be 1:1 or higher (see Figure 5.3).

**Figure 5.3: Illustration of height to width ratios along thoroughfares**

The urban form standards not only define building heights, for retail and commercial uses they also define the maximum number of floors for that use within a mixed use building. This is important to maximize the extent of active retail and commercial uses that front onto streets to support a dynamic pedestrian environment.

**Transect Zones**

The Places29 Transect Map distinguishes six transect zones, known as the Northern Development Area Transect Zones (NDT zones):

**NDT 1 – Development Area Preserve**

This zone consists of open space areas that are protected from development, including areas of publicly or privately owned open space with deed or similar restrictions requiring the land to remain as open space. These areas include: water bodies, wetlands, riparian lands, woodlands, flood plains, and other undeveloped lands, as well as buffers to protected open spaces that are currently preserved in perpetuity.

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6 Two of these, Development Area Preserve (NDT 1) and Developer Area Reserve (NDT 2) are illustrated as one category in the Transect Map, as the details of the type of protection for private properties were not available for the preparation of the map.
**NDT 2 – Development Area Reserve**
This zone consists of open spaces that are undeveloped or in agricultural use and will remain as open space or agricultural areas under the terms of this Plan. These areas include: steep slopes, open space buffers, and floodplain areas that are not yet protected as open space.

**NDT 3 – Urban Edge**
This zone is characterized by one- or two-story (with occasional three-story) buildings. Residential buildings may be single-family detached, duplexes, townhouses, garden or courtyard apartments or residences of similar character with mostly landscaped front and side yards. Nonresidential buildings may be separated from the street by landscaped front yards.

**NDT 4 – General Urban**
Development in this zone includes a broad range of residential and nonresidential building types in mixed- and single-use settings, with buildings ranging from 1 to 4 stories, with most buildings being 2 stories or taller. The mix of residential building types ranges from denser types of detached housing to attached unit types. Nonresidential building types and activities also span a broad range due to the high number of different use designations that may occur in this zone. Shallow to moderate front and side yards may separate buildings from the street, while in centers buildings with nonresidential ground floor uses should generally come up to the street in order to create a high-quality and active pedestrian-oriented street.

**NDT 5 – Urban Center**
The majority of Centers in the Places29 area fall into this transect zone. Buildings in this transect zone can range from 1 to 6 stories, with most buildings being 2 stories and above. Mixed-use and nonresidential buildings are generally 3 stories or taller. While mixed-use development with residential upper floors is the predominant land use type, this zone also includes attached housing types, such as townhouses and apartments, and intense levels of nonresidential uses. Buildings tend to come up to the sidewalk or are separated from it by shallow setbacks. Pedestrian-oriented streets are parallel or perpendicular to adjacent major through streets, such as US 29, Airport Road, and Rio Road. Within centers, nonresidential ground floor uses should generally come up to the street in order to create high-quality, pedestrian-oriented streets in the centers.

**NDT 6 – Urban Core**
The Urban Core has the highest land use intensity and pedestrian and transit activity levels in all of Places29. Buildings in this transect zone can range from 3 to 8 stories, with most buildings 4 or more stories. The zone includes high intensity, mixed-use development with residential uses located above first (and sometimes second or third) floor nonresidential uses. Employment, entertainment, civic, and cultural uses all mix in this area. Attached buildings that come up to the sidewalk and form a continuous building wall are the predominant building type in the Urban Core. Parking is typically accommodated in structured parking facilities.

**Transect Map Description**
The Transect Map illustrates the gradient of intensity/density in the Places29 area. This gradient creates transitions from areas of higher intensity toward less intense zones at the edges of the area. The latter create a transition between the Development Areas and Rural Areas, as well as areas with the environmental and recreational importance along the North and South Forks of the Rivanna River. The map also illustrates the overall subregional gradient of intensity from Neighborhoods 1 and 2 toward Pinney Mountain and the northern end of Albemarle County. The multitude of Centers and clusters of Centers in the Places29 area create a pattern in which the
walkable areas surrounding each Center frequently overlap. This pattern creates multi-lateral relationships between adjoining Neighborhoods and limits the usefulness of an intensity gradient that includes an “edge” toward the border of each Neighborhood7.

**Neighborhood 1**

The areas immediately west of US 29 fall into the Urban Center (NDT 5) designation. This is consistent with the concentration of Neighborhood Service, Community, and Destination Centers located between the corridor and the proposed parallel roads, as well as the concentration of employment uses in this area. This area of Neighborhood 1—and the uses immediately east of US 29, located in Neighborhood 2—already constitute the most urban place in Albemarle County. The NDT 5 transect designation will allow the area to mature over time as a key urban center within the County. A rhythm of these clusters of Centers is established by intervening zones of General Urban (NDT 4), which provide a variety in scale and intensity to development along US 29.

West of US 29, the Berkeley Neighborhood and two other areas of existing single-family homes are the only areas designated Urban Edge (NDT 3), reflecting the intensity and form of their existing uses. The remaining areas beyond the stretches of NDT 5 along US 29 are defined as Urban General (NDT 4), without a further transition to the western edge of Neighborhood 1. This is consistent with the majority of existing residential development. The pattern creates an appropriate transition to adjacent urban areas in the City of Charlottesville. Hydraulic Road/Rio Road West, a major thoroughfare, defines the western edge of the Development Area. This condition is a notable exception to the typical gradient of density/intensity established toward most of the boundaries of the development areas. The street’s width, in conjunction with the proposed landscaping treatments along its edges, is an appropriate transition between the urban environment in Neighborhood 1 and the adjoining Rural Area, and is a refinement of the current urban form of the area.

**Neighborhood 2**

Similar to Neighborhood 1, development along US 29 falls into a combination of NDT 5 and NDT 4 designations. This reflects the existing intensity levels of residential development along Hillsdale Drive and directly east of Albemarle Square, and the potential for revitalization of the existing commercial development adjacent to US 29.

East of US 29, the intensity of uses is generally defined by the existing pattern of lower intensity development, designated as Urban Edge (NDT 3) throughout the established neighborhoods of Raintree, Woodbrook, Dunlora, and Westmoreland. Along the Rio Road East corridor, portions of the adjoining areas are defined as General Urban (NDT 4). This is a reflection of the road’s importance as a major transportation corridor and the presence of existing multi-family developments, as well as two Neighborhood Service Centers. The NDT4 designation of areas east of Rio School Lane is consistent with recommendations for more urban development contained in the Meadow Creek Parkway Final Report8.

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7 A concept described in the Neighborhood Model and the Crozet Master Plan, but not universally applicable in the more urban environment of the Northern Development Areas.

Hollymead

The structure of transect zones throughout the Hollymead area creates transitions in the intensity of uses from higher levels along US 29 to less intensity towards the Charlottesville-Albemarle Airport and the Development Areas’ boundaries. However, in contrast to Neighborhoods 1 and 2, which are located closer to Charlottesville, the average intensities of uses along US 29 north of the South Fork of the Rivanna are lower and reach Urban Center levels (NDT 5) only in central Hollymead. The highest level of intensity (NDT 6 – Urban Core) is designated in the Uptown area. The Uptown is envisioned to be an active urban place that is the primary center in the Places29 area. This is reflected in the Uptown’s Urban Core designation, the only location in the Places29 area to receive this designation. As one moves away from this Urban Core area, intensities transition to lower intensity Transect zones. NDT 5 zones in central Hollymead are mainly associated with development in the Hollymead Towncenter and North Pointe areas, as well as Centers at the intersection of US 29 and Proffit/Airport Roads, centers within the University of Virginia Research Park, and areas adjacent to the Uptown.

In the northern and southern sections of Hollymead along US 29, residential and employment uses transition down to Urban General (NDT 4) and Urban Edge (NDT 3), with the Urban Edge zones abutting the floodplain of both forks of the Rivanna River. Away from US 29, intensities transition to Urban Edge toward the eastern Development Area boundary. The Airport District defines much of Hollymead’s edge toward the Rural Area. The current Airport Master Plan designates most of the western edge of this District as open space.

Development intensities throughout the area’s extensive employment uses do not transition down in the same way they do toward the eastern edge. They remain at Urban General levels out to Dickerson Road. Here development should transition to the adjacent Rural Area through the use of forested landscape buffers. In contrast to Hydraulic Road in Neighborhood 1, the Development Area boundaries in Hollymead are not demarcated by larger thoroughfares.

Piney Mountain

West of US 29, Transect Zones are established by the already existing or approved residential developments (Briarwood and Camelot) and employment uses (GE Fanuc). The transition of the NDT 4 area associated with employment uses is separated from the adjoining Rural Areas by forested buffers.

In the area east of US 29, a transition from a zone of Urban General with employment, mixed use, and residential uses is created by stepping down to a band of Urban Edge (NDT 3) along the northern and eastern edges of Piney Mountain. The zone of NDT 1/2 along the North Fork of the Rivanna River creates a natural buffer between the urban uses and this major feature of the natural landscape.

Table LU1 – Neighborhood Land Uses organized around Centers
Table LU2 - Land Use in Centers
Table T1 – Center Relationship to Transect Zones
Table T2 – Transect Zones
Key Subareas of the Framework Plan

The following subareas are particularly important to the community’s vision for the future of the Places29 area:

- The Rio Road/US 29 (Midtown) and Uptown areas have the opportunity to become vibrant destinations with a broad mix of commercial, residential, and employment uses. Both areas have major implications for future transit options in the Places29 area as major activity areas that can be conveniently served by transit.

- The University of Virginia Research Park and the NGIC facility will continue to develop as major employment centers. This plan offers the opportunity for the University of Virginia Research Park to include a more integrated amount of residential and commercial uses.

- While the Charlottesville-Albemarle Airport will develop according to its own master plan, the integration into the Places29 area is critical, both with regard to the quality of the transportation infrastructure and the synergy with surrounding land uses – particularly the Uptown.

The following paragraphs address each of these areas in greater detail.

Rio Road/US 29 (Midtown)

Over the life of this Master Plan, the area around the intersection of Rio Road and US 29 will redevelop into a vibrant mixed-use node of activity. It will include a cluster of Community and Destination Centers and a larger Mixed Use Neighborhood in the southwestern “quadrant” of the intersection. This mixed-use node is also referred to as “Midtown,” because of its location halfway between the Uptown and the City of Charlottesville, and the future concentration of activity in the Uptown and the University of Virginia Research Park.

The envisioned development of this area includes the long-term transformation of Fashion Square Mall into a Destination Center that includes residential uses on upper floors of mixed-use buildings. At first, these buildings would be located on parts of the surface parking lot. This parking would be replaced by structured parking. In the final stages of this transformation, the mall itself may begin a transformation from a monolithic building into a series of mixed-use buildings oriented toward new streets through the former surface parking lots.

The potential for economic revitalization of the area is supported by a set of proposed transportation improvements, which include a grade separation of Rio Road and US 29, as well as a “Ring Road” that will create at-grade connections between the four “quadrants” at signalized intersections east and west of US 29 and north and south of Rio Road. A pedestrian-bike bridge between the end of Berkmar Drive and the western edge of the Fashion Square Mall parking lot will increase connectivity between the southeastern and southwestern portions of the Midtown (see plan drawing in Figure 5.4 and a photo simulation of the proposed bike/ped bridge in Figure 5.5). On the Berkmar Drive side, the entrance ramps and stairs to this bridge would be located in a building compatible with adjacent mixed-use development. On the Fashion Square Mall side, the bridge would connect to the ring road in front of the mall building (shown in the background of Figure 5.5). Figures 5.4 and 5.5 also illustrate the potential configuration of parking garages with ground floor retail that could be part of the early stages of a land use transformation in the mall’s surface parking area.
The sequence of photo simulations in Figures 5.6 through 5.8 illustrates the transformation of the southwestern quadrant of the Midtown along Berkmar Drive. It also illustrates how this transformation occurs incrementally and driven by individual decisions (here just illustrated as an example) made by various property owners in the area. The specific character of the new development is governed by the design guidelines and by future, more detailed guidance included in the Small Area Plan intended for the area.

The transformation of Albemarle Square, which constitutes another important component of the Midtown, is discussed in the Opportunities for Redevelopment section below.

This area is also expected to be connected to Downtown Charlottesville and the University of Virginia with enhanced bus or Bus Rapid Transit (BRT) service, once a certain level of redevelopment and land use intensification has begun. This initial phase of BRT could later be extended to the Airport, once land use and activity intensities in the Uptown, Hollymead Towncenter, and Research Park areas have increased sufficiently to justify the extension of BRT service.

**Uptown**

The Uptown will be a vibrant new urban center in the northern portion of Places29 similar to a traditional downtown area and intended to serve the needs of many people in a relatively small area. People can walk throughout the area, patronizing various businesses and amenities. The Uptown will take advantage of the regional attraction of the airport, the University of Virginia Research Park, and the new regional retail activities in Hollymead Towncenter and North Pointe. The Uptown will provide a complementary and more urban place within this regionally attractive location. The Urban Mixed Use portion of the Uptown is anchored by restaurant and entertainment uses, and is paired with a strong Employment Mixed Use component that includes portions of the Research Park. This area may include a hotel and other uses that support the concept of living, working, and entertainment in the Uptown area. The ability to walk to urban services and entertainment from the campus-like setting of the Research Park should make it an even more attractive location for knowledge-based businesses.

It is expected that in the mixed use areas, residential uses will be developed above retail or commercial ground floor uses (vertical mixed use). These areas may also contain some convenience retail, as well as urban open space and a significant recreational or civic facility.

**The University of Virginia Research Park**

Land uses in the Research Park shown on the Framework Map are consistent with the University of Virginia Foundation’s long-term, conceptual site plan. This includes the general location of developable areas, a Neighborhood Service Center along Lewis and Clark Drive, a residential land use component north of Lewis and Clark Drive, and public and semi-public open spaces and Greenways. The portions of the Research Park property that fall within the Uptown have been designated to fit with both the Research Park’s mission statement and land use program for the area, as well as with the Employment Mixed Use characteristics envisioned for the Uptown. The goal is for the Research Park and the Uptown to enhance the viability and value of each other.

The sequence of photo simulations in Figures 5.9 through 5.11 illustrates how development in the Uptown is compatible with the Foundation’s plans for office and R&D uses near the corner of Lewis and Clark Drive and Airport Road. Most importantly, the sequence shows how, through

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9 Proposed by not yet constructed at the time of the writing of this document.
strategic phasing and site planning, it is possible to develop a mixed-use building with first floor retail that marks the entrance to the Uptown and the Research Park. In the early stages of development in the Uptown, economics will likely require that the necessary parking for office and R&D buildings in the Research Park be located in surface parking lots (Figure 5.10). At this stage of the development, a mixed-use building at the corner is unlikely to be feasible. The site planning approach illustrated in the photo simulations, therefore, uses the future site of the desired mixed-use corner building as a surface parking lot until the increasing density of the surrounding buildings and changing market conditions make structured parking and the implementation of the mixed-use building feasible (Figure 5.11).

The final image of the sequence indicates Bus Rapid Transit service to the area, which may be realized once the necessary ridership levels in the larger Hollymead area have been reached.

**Charlottesville-Albemarle Airport**

Airport operations at the Charlottesville-Albemarle Airport have impacts that require the Airport to be physically buffered from the surrounding areas. For this reason, the Airport has been classified as a single-use district, which is not required to follow the concepts of the Neighborhood Model. However, it is no less important that the Airport be well-connected and integrated into the Place29 transportation network, the City of Charlottesville, and the larger region.

The Airport’s continued growth will play an important role in the development of the Uptown, Hollymead, and the County.

Over the longer term, the combination of the Uptown, the Airport, the Research Park, and other activities in the area are expected to create the opportunity to provide transit service between this northern node of activity and both the areas of the County to the south and Charlottesville.

**Recommended Development Area Boundary Expansions**

Two potential Development Area boundary adjustments are recommended as part of this Master Plan. These adjustments would transfer land that is now in the Rural Areas and immediately adjacent to the Development Areas into the Northern Development Areas (the Places29 area). The two proposed expansions are:

1. Hollymead—South: the area west of US 29, north of the South Fork of the Rivanna River and south of the Community of Hollymead. This proposed expansion area is adjacent to Hollymead.

2. Piney Mountain—Southeast: a portion of the Rural Areas immediately south of Piney Mountain and adjacent to the property now owned by the National Ground Intelligence Center.

During the analysis of these expansions, consideration was given to the need for additional land within the Development Areas to accommodate additional residential or nonresidential uses. The assessment of need is based on the estimated land use capacities of the current Places29 area. Then, if additional land is needed within the Master Plan timeframe, the second step in the analysis is to determine what land use designation or designations would be most appropriate for each expansion area. Based on the analysis, the Framework Plan and Map include these two recommended changes to the current Development Areas.
**Hollymead – South**

The first expansion area recommended in the Master Plan is the area south of the current southern boundary of the Hollymead Development Area and west of US 29. This expansion area is related to the proposed extension of Berkmar Drive across the South Fork of the Rivanna River to Meeting Street in Hollymead Town Center. The cost for this transportation improvement is expected to be significant and will require a combination of public and private funding. The County currently relies on financing new roads through developer contributions. An alignment of Berkmar Drive Extended through the Development Areas would likely offer more incentive for a developer to finance this new road, and the road would be needed to serve the new development around it. If the road runs through the Rural Areas, the very low density and the very restricted types of development permitted would not offer a sufficient level of development to support construction of the road. For these reasons, the Master Plan expands the Development Area boundary to allow a higher level of development to support construction of Berkmar Drive Extended.

The selection and distribution of land use designations within the expansion area that are shown on the Framework Map reflect the community’s desire to maintain the appearance of the forested stretch of US 29, and to facilitate a transition from the high intensity of the Hollymead Town Center to the open space at the South Fork of the Rivanna River. Additional large-scale commercial development was not included in the expansion area, since it would be inconsistent with these goals and because the overall structure of the area north of the River is intended to follow the Neighborhood Model rather than replicating the commercial strip development patterns that exist along US 29 in Neighborhoods 1 and 2. The combination of a Neighborhood Service Center and the surrounding residential uses agrees with: 1) the concept of distributing smaller neighborhood-serving mixed use areas throughout the Places29 Area, 2) the desire to minimize visible development along this part of US 29, and 3) the concept of a land use intensity gradient that is high in the Hollymead Town Center area and decreases toward the adjacent Rural Areas and along the South Fork of the Rivanna. The forested appearance of US 29 from the River north almost to Hollymead Town Center will remain largely unchanged as deep landscape buffers will be required between US 29 and the development in the expansion area.

**Piney Mountain – Southeast**

The Master Plan also recommends expanding the boundary of the Piney Mountain Development Area to the southeast by approximately 53 acres to reflect a recent commitment by the Board of Supervisors made in association with the expansion of the NGIC facility. The shape of the expansion takes into consideration the topographic conditions in the area, an existing portion of the necessary access road from US 29 to the area, and the proximity of the area to existing water and sewer service. The Framework land use and Transect Zone designations assigned to the expansion area reflect the transition from the Urban General employment area to an Urban Edge residential area and then to the adjacent riparian and water resource features along the eastern edge of the area.

**Historical and Cultural Resources**

As discussed in Chapter 3 – Existing Conditions and Future Trends, a review of maps and data maintained by the County and the state Department of Historic Resources (DHR) indicates that

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10 About 100 feet deep with the possibility of lesser depths (60 to 80 feet) in areas where the topography along US 29 is creates embankments that effectively screen adjacent development.
the Places29 area includes a variety of historic and archeological resources. Although the Master Plan does not specifically call out locations of particular historic or archeological resources (to prevent disturbance or other adverse impacts), the implementation strategies of the Historic Preservation Plan (a component of the County’s Comprehensive Plan) will be applied to such resources located in the area. All applicants for development projects are responsible for verifying with County Staff whether historic or archeological resources are present on a parcel and the applicable recommendations in the County’s Historic Preservation Plan. Whenever development is proposed for a property that includes a historic and/or archeological resource, this resource needs to be taken into consideration through all stages of planning and detailed site plan development.

The County’s ongoing efforts, conducted in conjunction with the State’s Division of Historic Resources (DHR) to update surveys of historic and archeological resources will help to gain a better understanding of the nature and current condition of resources throughout the County, including those located in the Places29 area.

**Redevelopment vs. Greenfield Development**

While Neighborhoods 1 and 2 are largely builtout and future development is likely to occur as infill development or redevelopment, the Places29 Area north of the South Fork of the Rivanna River includes substantial areas of developable land that are currently vacant or support only scattered residential uses. These sites are often referred to as “greenfield” sites. Chapter 8 – Implementation provides additional discussion of implementation steps that should be taken to support and encourage the redevelopment of sites in the Places29 Area.

**The Economics of Redevelopment**

In a discussion of redevelopment versus greenfield development, the most fundamental implementation issue is that, without a supportive regulatory environment, economics will often constrain redevelopment if greenfield capacity exists. This can make it difficult to realize the goals of the Neighborhood Model in areas that have the potential for redevelopment. If all other factors (e.g., location, access, and trade area) are equal, in almost every instance, it is easier and less expensive to use an undeveloped parcel of land (a greenfield site) than it is to redevelop an already improved site. Four factors make redevelopment more difficult:

1. Complex land assembly
2. Demolition costs
3. Price of land
4. Development financing

**Complex Land Assembly.** Often, older commercial uses are on relatively small sites. Major redevelopment requires that the developer negotiate with multiple property owners to assemble a redevelopment site. This takes time and time is money. If land of equal value is available from a single owner, an economically motivated developer will nearly always choose this more efficient option. Alternatively, a developer can look to use a smaller parcel, but would restrict both the type and profitability of development. Also, fewer developers are likely to have an interest in pursuing smaller development opportunities.
Redevelopment tends to cost more because a developer not only has to buy the land, but the value of the existing improvements on the land, regardless of whether those improvements have any value to the investor or not. If the improvements are unnecessary, redevelopment will also carry the additional cost of demolition.

It can cost a developer great deal to provide sufficient incentives to persuade an existing owner to sell an older use that is still operating. Older strip commercial shopping centers are an example. The owner of a strip shopping center built in the 1970s may have no remaining debt on the center. Thus, even though the shopping center may charge lower rents than its newer competitors, the owner of the older center can make a lot of money (maybe even more than the owners of the newer centers). The rental income is an annuity that the sales price must justify giving up.

![Economics of an Old Shopping Center vs New Shopping Center Illustrative Example](image)

<table>
<thead>
<tr>
<th></th>
<th>Old /1</th>
<th>New</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size (Square Feet)</td>
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<td>200,000</td>
</tr>
<tr>
<td>Rent /Square Foot</td>
<td>$14.00</td>
<td>$20.00</td>
</tr>
<tr>
<td>Net Operating Income</td>
<td>$2,800,000</td>
<td>$4,000,000</td>
</tr>
<tr>
<td>Debt Service</td>
<td>$0</td>
<td>($2,400,000)</td>
</tr>
<tr>
<td>Cash Flow to Owner</td>
<td>$2,800,000</td>
<td>$1,600,000</td>
</tr>
</tbody>
</table>

1. Assumes owner has no debt on the center anymore.

Source: ZHA, Inc.
implementation/shpg center

Table 5.2: Shopping Center Economics

In the free market, redevelopment occurs when a parcel (or parcels) of land have such a unique market advantage that it justifies the additional costs of redevelopment. An example of parcels with unique value would be parcels adjacent to Downtown Charlottesville’s pedestrian mall. When redeveloped, such parcels would benefit from the existing retail traffic in the area, as well as the market advantage that comes from the public’s already established knowledge of the areas’ retail and service opportunities.

One common method used to encourage redevelopment is to limit the amount of commercial land available for greenfield development. As the demand for commercial land grows and the supply of “greenfield” land shrinks, older commercial sites (“greyfields”) become more valuable. Because of the scarcity of commercial sites, the value of the “greyfield” sites increases, thereby justifying the additional costs associated with redevelopment. Redevelopment recycles the land and infrastructure, it also benefits established neighborhoods and business centers. Redevelopment of commercial properties can also benefit existing property owners who have the opportunity for increased income either through property sales or development partnerships. Additionally, redevelopment can benefit adjacent neighborhoods, especially their property values, by increasing the quality and quantity of goods and services available nearby, and by improving the aesthetic quality of surrounding commercial areas.
For the Places29 area, the Framework Map reflects the relationship between the number of designated regional Destination Centers north of the South Fork of the Rivanna River and the pace of “greyfield” redevelopment south of the River. The more regional Destination Centers are planned north of the River, the slower the pace of “greyfield” redevelopment will be to the south. Unfortunately, in a commercial strip setting like US 29 south of the South Fork of the Rivanna River, with no restrictions on greenfield development to the north, it is more difficult to differentiate parcels in the marketplace. One goal of the planning process is to encourage compact urban development at key intersections to achieve a unique market advantage. Such regulatory moves can help to enhance redevelopment potential while supporting other quality of life and transportation goals.

Some municipalities enhance the potential for redevelopment by entering into public/private partnerships. In such cases, the municipality may reduce the cost of redevelopment by paying for public use items, such as road improvements, sewer and water improvements, parking and transit. Some municipalities also offer tax incentives to encourage redevelopment.

There are many places in the Places29 area that could benefit from redevelopment. However, without regulatory initiatives and incentives to enhance redevelopment potential, it is unlikely that much of the growth projected over the next 10 years will be in the form of redevelopment.

**Opportunity Sites for Redevelopment**

Sites that are more likely to convert from their existing use or to revitalize and add other uses that complement the existing use are called “opportunity sites.” These sites will play an important role in the implementation of the Plan. The Plan’s goal of a variety of mixed-use centers in Neighborhoods 1 and 2 will require redevelopment since these centers are located primarily on currently developed properties. Many of these sites are underutilized, or will become underutilized in the future as the economics of Albemarle County continue to change. Once successful implementation of land use types and mixes on an initial opportunity site demonstrates the process and value of redevelopment, it will trigger the redevelopment of other portions of the Places29 area. These initial sites could also be called “catalyst” opportunity sites because of their potential to accelerate redevelopment of other properties.

A range of conditions indicates that a site has potential to redevelop:

- Marginal economic viability of existing use(s);
- Diminished attractiveness and functionality due to outmoded building types (e.g., old strip malls);
- Poor condition of the site or the existing buildings, which may indicate that the rents provide an adequate income to the owner. However, the buildings may not be maintained and attractive to businesses that can afford higher rents;
- Vacant land in an otherwise built-out area may be a prime candidate for an infill site;
- Land uses out of character with prevailing adjacent uses (e.g., an industrial use in a predominantly retail area);
- Underutilized sites (i.e., sites where only a portion of the site is occupied by active uses).
- Partially developed sites (i.e., sites where the developer is holding on to undeveloped portions until market conditions are favorable
- Developer/property owner interest in or inquiries about changing the use of a site.

**Examples of Opportunity Sites**

**Key Potential Opportunity Sites**

One task during preparation of the Places29 Master Plan was the identification of sites that are prime candidates for redevelopment. Several were identified, based on the conditions listed above. Some examples of key opportunity sites (see Figure 5.12) are:

- The four quadrants of the US 29/Rio Road intersection that make up the area called “Midtown”[1]
- The area surrounding the US 29/Proffit/Airport Road intersection [2]
- The Sam’s Club and Wal-Mart area, in conjunction with the construction of Berkmar Drive Extended [3]
- Several small commercial centers along Rio Road West and Hydraulic Road [4]
- Existing commercial development along Rio Road East in the area known as “Gasoline Alley” [5]

These are just a few of the potential opportunity sites in the Places29 area. Whether or not opportunity sites are redeveloped depends on decisions by individual property and business owners, although public policy decisions can support redevelopment in key locations. Potential tools for supporting redevelopment are discussed in Chapter 8 – Implementation.

Two examples of potential redevelopment scenarios in the Places29 area demonstrate how sites can develop in phases to reach a level of development consistent with that envisioned under the Master Plan.

**Redevelopment of a Single-Use Site—the Sam’s Club Example**

Constructing Berkmar Drive Extended as a parallel road (to US 29) beginning at the proposed Midtown and continuing north to the proposed Uptown creates an opportunity for the long-term transformation of the Sam’s Club building and parking lot into a mixed-use Neighborhood Service Center. The redevelopment of this single-use site also represents a major opportunity to give the section of Berkmar Drive Extended a character that is focused around pedestrian activity. (NOTE: Sam’s Club is used solely as an example. There has been no indication by the current owners that they intend to redevelop the site.)

Construction of Berkmar Drive Extended along the western edge of the Sam’s Club parking lot would represent the initial phase of redevelopment. Because the parking lot is sized to accommodate parking needs on the heaviest shopping days of the year, it should be possible to build the street without a significant impact on the shopping activities (see Figures 5.13 and 5.14).

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11 The numbers in square [ ] brackets correspond to the numbers in Figure 5.12.
Redevelopment of the actual site would begin by filling in portions of the remaining parking lot along the Berkmar Drive frontage (see plan diagrams in Figures 5.18 and 19 and the photo simulation in Figure 5.15). This step transforms the character of Berkmar Drive into a collector street with a neighborhood-serving retail (Figure 5.16). Once market conditions support the use of structured parking for the new mixed use buildings, more surface parking could be converted to mixed use. The final phase would be to rebuild the Sam’s Club building as multiple retail and mixed use buildings (Figure 5.20).

Redevelopment of a Shopping Center Site—the Albemarle Square Example

Albemarle Square is one of several older shopping centers in the Places29 area that, within the next 5 to 10 years could redevelop. The type of redevelopment encouraged by the Master Plan is into a mixed-use center. The hypothetical example of how Albemarle Square could redevelop illustrates how the same process could occur on other mall sites in the Places29 Area (see plan diagrams in Figures 5.24 to 5.26). (NOTE: Albemarle Square is used solely as an example. There has been no indication by the current owners that they intend to redevelop the shopping center.)

The process of redevelopment could begin by developing portions of the mall’s surface parking with mixed use buildings; this approach would allow existing tenants to remain, if they chose. Through careful site planning, some of the drive aisles of the existing parking area would be converted into pedestrian- and bicycle-friendly streets, which would then face both new and remaining older buildings (Figure 5.21 and 5.25). Depending on the overall parking needs, which should take into account opportunities for shared parking and other ways to managing parking demand, parking may be accommodated in a combination of surface lots and structured parking garages. Depending on market demands, as existing buildings are demolished, those sites and portions of surface parking lots could be developed with mixed-use buildings (Figure 5.22 and 5.26). As more sections of the existing parking lot are infilled, most parking would be in either subsurface parking garages or parking located in garages that are internal to the new blocks and have active commercial or residential uses facing the street (Figure 5.23 and 5.27).

While the recommended public open spaces may not be built at the beginning of the redevelopment process, careful consideration should be given to their future location in the early stages of redevelopment. Central and easily accessible locations should be chosen for these public open spaces to ensure that they are fully integrated, functional, and beneficial to the residents and other users of the mixed-use center.

Areas for Further Study

This Framework Master Plan is not intended to address all aspects and details of future development in the Places29 area. Some subareas will need further study and more detailed plans in order to implement the land use patterns described in the Master Plan. In addition, it will be necessary to make changes and adjustments to current policies and the administration of development activities in order to achieve the Master Plan goals.

Areas Recommended for Future Small Area Plans

Small Area Plans are a planning tool used to guide land use, zoning, transportation improvements, open space, and other capital improvements at a higher level of detail than is possible in a Framework Master Plan. Due to the greater level of detail, a Small Area Plan can also identify and address specific local conditions and opportunities for commercial revitalization and, where called for in the Master Plan, mixed-use development. Small Area Plans are a recommended implementation tool for subareas where significant redevelopment activity and
transportation improvements are recommended in the Master Plan. The Framework Map identifies two areas as candidates for Small Area Plans:

1. **The Rio Road and US 29 Intersection and Midtown Study Area**

   The four quadrants around the intersection of Rio Road and US 29 are expected to experience a great amount of redevelopment in the next 5 to 10 years, and beyond. In particular, the southwestern quadrant ("Midtown") with its multitude of properties would be well-served by the level of planning and coordination that a Small Area Plan can provide. In addition to encouraging and supporting redevelopment, the proposed grade-separation for the intersection of Rio and US 29 can be addressed during the same planning process. More information about the coordination of a small area plan prepared by the County with the development of the design for the grade-separation by VDOT is given in Chapter 8—Implementation.

2. **The Airport Road Corridor and Uptown Study Area**

   The Airport Road Corridor and the Uptown includes properties that will be redeveloped, as well as properties where substantial new development is expected during the Plan’s timeframe. Some portions of the area shown a pattern of small property ownership, similar to the pattern in the Midtown area, while other large areas are under single ownership.

Please refer to Chapter 8—Implementation for a more detailed discussion of Small Area Plans and the process that will be used to prepare them. Other implementation tools that will help the County move forward with redevelopment for opportunity sites are also discussed in Chapter 8.

**Green Infrastructure**

Albemarle County’s open spaces, natural features, and scenic areas are at the heart of the County’s character and livability, and have attracted many residents to the County. These open spaces and the County’s designated Rural Areas also provide a counterpoint to the urban character of the Development Areas and the City of Charlottesville, enabling residents to experience the high quality of life in Albemarle County.

Many goals and provisions of the County’s Comprehensive Plan are devoted to maintaining the overall rural character of the County, as well as its open space and natural resources. These goals led to establishing the Development Areas and the use of the Neighborhood Model as a planning paradigm for creating walkable neighborhoods and desirable urban environments.

Because some of the new neighborhoods in the Northern Development Areas will be among the County’s most urban places, it is important to maintain a sense of connectedness to the rural surroundings as well as the natural features and open space assets located within the Development Areas. It is equally important to provide an appropriate level of public parks that meet the recreational needs of current and future residents in the Places29 Area. The Green Infrastructure Map reflects the elements that will provide the desired open space network and connections to the surrounding areas as well as other key elements of the open space system that complement the framework of land uses in the Northern Development Areas.
Green Infrastructure Map Description

The Green Infrastructure Map (Figure 5.29 A and 5.29 B) illustrates the system of public and semi-public open spaces that will serve active and passive recreation needs of residents, workers, and visitors in the Places29 Area. The map shows a network of linear open spaces that interconnect the various elements of green infrastructure in the Northern Development Areas. Such networks provide ecological benefits to flora and fauna, can be integrated into stormwater management solutions, and be utilized to create non-roadway connections for pedestrians and bicyclists.

The Green Infrastructure Map shows several types of environmental features that will require special consideration when planning a new development or redeveloping an existing area. These features include floodplains, stream valleys, steep slopes, wetlands, and other features. Property owners and developers who consult the Framework Map for guidance on development of property will also need to take into account environmental features shown on the Green Infrastructure Map.

The map also illustrates a network of existing and proposed trails, multi-use paths, and bicycling facilities that will afford residents convenient non-vehicular connections between different parts of the Development Areas, to open space amenities located throughout, as well as connections to major recreational facilities located in the Rural Areas, such as the North and South Forks of the Rivanna River, Ivy Creek Natural Area, and Chris Greene Lake Park (see section Future Transportation Network in this chapter).

Finally, the Map illustrates key public facilities such as existing and planned schools, fire stations, and libraries. Combining the depiction of these facilities with that of bicycle and trail connections illustrates how particularly schools and libraries can be accessed with non-motorized transportation modes.

Public Open Space

Public open spaces are a critical element to creating livable neighborhoods and places. This Master Plan therefore contains specific requirements for the inclusion of public open spaces in future development. These are outlined in the following paragraphs.

Public Parks

Recreational Facilities Associated with Schools

All existing public parks in the Places29 Area are associated public schools located in or adjacent to the area. The addition of a new elementary school in the North Pointe area will add X [Staff: Is this correct?] acres of public park land at the Community Park service level. The Table below provides an overview of all public parks at schools. Parks associated with schools will continue to play an important role in providing publicly accessible play fields and other facilities for active recreational uses. Due to the type of facilities provided, these parks have the potential to attract users beyond the neighborhoods that immediately surround them. The bicycle paths and trails network illustrated on the Green Infrastructure Map provide the necessary accessibility to this end.

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<td></td>
</tr>
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<td>Community Park</td>
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Northern Development Areas - Framework Master Plan | 2nd DRAFT

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<td>Community Park</td>
<td>Woodbrook Elementary School</td>
<td>7 acres</td>
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<tr>
<td>Community Park</td>
<td>New School at North Pointe</td>
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<table>
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<td>Albemarle High School Complex</td>
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<tbody>
<tr>
<td>County Park</td>
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<tr>
<td>Chris Green Lake Park</td>
</tr>
</tbody>
</table>

Table 5.3: Overview of park service levels provided at schools in the Places29 area

**Existing and Planned Public Parks**

New public parks will be included in every Community Center, Destination Center, Civic Green Center, and the Uptown (also see Chapter 6 – Community Facilities and Services).

The following gives an overview of the individual types of public parks in the Places29 Area. Additional details are included in the Chapter 7 – Unified Design Guidelines (also see Public Greens in Centers below).

**Civic Green Center**

The Civic Green Center is one of four Center types defined by the Master Plan. Civic Green Centers are public open spaces of 1 to 3 acres in size that serve as main focal points for the surrounding residential or employment land uses creating a walkable neighborhood. Civic Green Centers may include a tot lot, playground or other smaller scale facilities for active recreation as well as multi-purpose lawns and park areas with ornamental character, dedicated to passive recreation.

The Green Infrastructure Map illustrates only approximate locations for Civic Green Centers. Their final location will be determined either during the planning stages of larger rezonings or through the Small Area Plans. Their approximate location is determined by analyzing the extent of walkable areas around all Neighborhood Service, Community, and Destination Centers as well as the Uptown. New development that falls outside of any of the walking sheds created by these mixed use centers requires the presence of a Civic Green Center in order to create a Neighborhood according to the definitions outlined in Chapter 4 – Place Types. The required Civic Green Center should be located centrally to any such areas outside of the walking sheds formed by the mixed use centers.

**Public Green**

Public Greens are a required element in Community and Destination Centers, and in the Uptown. These Greens are 2 to 3 acres in size and have a program similar to Civic Green Centers. Public Greens provide a focal point to the activity in a mixed use center that should be well integrated into and centrally located in the fabric of the uses in these more intense Center Types. It is encouraged that Public Greens be paired with civic or institutional uses, such as libraries, museums, day care or teen facilities, or community centers, in order to broaden the level of public activity and to extend the hours of activity into the evening.

NOTE: Land use standards for Neighborhood Service Centers allow for, but do not require, a Public Green. For this reason they have not been indicated in the Green Infrastructure Map.
However, it is likely that a number of them will be built as part of future development in the larger Neighborhood Service Centers.

**Pocket Parks/Mini Parks**

The Unified Design Guidelines for the Northern Development Areas contain recommendations for smaller scale open spaces within the urban fabric, such as mini parks or public plazas (see Chapter 7 – Unified Design Guidelines for details). While limited in program (including elements such as playground, tot lot, seating area, multipurpose lawn or others) and scale, these facilities are intended to provide residents with a higher level of access to usable park spaces. It is the ultimate goal that each residence is within 1/8th of a mile from a neighborhood park, mini park or a Civic Green, Public Green. This requirement applies to all areas with new residential development or residential development in a larger redeveloping area.

**Other Existing and Planned Public Parks**

The Green Infrastructure Map also shows the two existing public parks that are not associated with schools. They are the Humphris Park in Neighborhood 1, a park currently used exclusively for passive recreation, and a park in the University Research Park north of Lewis and Clark Drive, which includes a variety of facilities for active recreation. The map also shows the planned, as of yet unprogrammed, public park land along the alignment of Meadowcreek Parkway in Neighborhood 2. This park land is expected to become available at the time of the construction of the parkway [Question to Staff: can we include an approximate timeframe here?].

**Public Indoor Facility**

The County is currently considering the future location of a public indoor facility. The areas under consideration include the Northern Development Areas. A final decision had not been made at the time of the writing of the Master Plan. If the facility were located in one of the four development areas, it would provide an important public recreational facility and community focal point. Please also refer to Chapter 6 – Community Facilities.

**Greenways and Blueways**

The County’s Greenways Plan contains a number of existing and proposed Greenways in and around the Places29 Area (see Chapter 3 – Existing Conditions and Future Trends). In this Master Plan, the Greenways that provide access to the North and South Forks of the Rivanna River are termed Blueways. This terminology is used on the County’s website but not in the (somewhat older) Greenways Plan. Use of the term Blueway is useful in light of more recent discussions in the field of open space planning and water resources management.

**Existing and Proposed Greenways and Blueways**

The existing and proposed Greenways already contained in the County’s Greenways Plan form the basis for the additional Greenways proposed under this Master Plan. These additions to the Greenways system are in the form of multi-use paths and trails represented on the Green Infrastructure Map. The width of Green- or Blueways beyond the minimum required for accommodating a multi-use path or trail\(^{12}\) will largely depend on the County’s ability to acquire or negotiate easements of adjacent land. The network of Green- and Blueways – if successfully implemented – would provide extensive access to County parks, the Rural Areas, and other open

\(^{12}\) See Greenways Plan for Albemarle County, 1999, for details about applicable path and trail dimensions.
spaces as well as the two Forks of the Rivanna, with their boating and other recreational opportunities.

This Master Plan recognizes the significant implementation issues associated with establishing Greenways through areas in which private property lines often directly abut streams and other linear open spaces through which alignments of some of the proposed Greenways, multi-use paths and trails run. Chapter 8 – Implementation therefore includes a discussion about how the County can move forward with addressing this issue.

**Access Points**

The Green Infrastructure Map also illustrates access points to the Greenway System already contained in the County’s Greenways Plan and a few additional access points suggested by County staff during the preparation of this Master Plan. The location of further access points along the proposed network of Greenways and open spaces should occur with the next update of the Greenways Plan and/or as part of development proposals for new development.

The County’s Greenways Plan defines the following three types of access points:

1. **Major Public Access Points:** These are located at established activity centers such as public parks and their amenities. These access points provide a full range of facilities and services, including rest rooms and public parking.

2. **Minor Public Access Points:** These are located at schools, offices, or major commercial areas. Typically, the provision of amenities is not feasible at Minor Public Access Points, but public parking is provided.

3. **Neighborhood Access Points:** These are located at or near residential or mixed use development. The developer or neighborhood association that is associated with the development located at the access point will determine the level of provided amenities and parking. Neighborhood Access Points may be located on public or private land.

The future designation of additional access points should occur by using the above-defined categories.

**Semi-Public Open Space and Other Open Space Network Elements**

This designation on the Green Infrastructure Map combines significant clusters and contiguous areas of steep slopes with larger areas of semi-public open space in existing larger developments (e.g., Forest Lakes, Dunlora, or Raintree). Where this designation is shown on the map as extending onto individual private properties, it illustrates that steep slopes are present and that these may have a bearing on the way in which the property could be redeveloped. As long as no redevelopment occurs, the designation as Semi-Public Open Space on individual, already developed parcels will not require any change.

The map also illustrates how semi-public open spaces, areas of steep slopes, the 100-year floodplain, and existing and proposed stream buffers combine to create a significant and comprehensive open space network. Such open space networks can provide substantial ecological, visual, and recreational benefits. The land area in the Places29 Area occupied by semi-public open space designation, 100-year Floodplain, existing and proposed stream buffers was used in identifying the alignments of proposed multi-use paths and trails also shown on the Green Infrastructure Map (see Future Transportation Network section of this chapter). The
proposed trails and multi-use paths and immediately adjacent open spaces represent proposed extensions to the County’s system of Green- and Blueways.

The following discusses individual elements of the open space network represented on the Green Infrastructure Map.

**100-year Floodplain**

The 100-year floodplain illustrated on the Green Infrastructure Map is defined in the County’s Comprehensive Plan and per the latest FEMA mapping available when the Master Plan was prepared. The illustrated 100-year flood plains are generally associated with the North and South Forks of the Rivanna River.

**Stream Buffers**

**Existing Stream Buffers**

Within its Semi-public Open Space designation, the Green Infrastructure Map includes areas that fall under stream buffer requirements for perennial streams and streams in water supply protection area. These buffers are subject to requirements defined in the County’s water protection ordinance. Stream buffers represented in the map may coincide with the 100-year floodplain, which extends upstream along several streams in the Places 29 Area. Together the 100-year floodplain, existing stream buffers, and water supply protection areas form and important basis in the County’s efforts to protect and manage water resources and to establish Green- and Blueways, that have both recreational and environmental benefits.

**New Places29 Stream Buffer**

This Master Plan adds a new stream buffer designation to the County’s existing stream buffer requirements. This new buffer would target intermittent streams that currently do not fall under the County’s stream buffer regulations. The buffer will extend 20 feet from the top of the stream bank along each side of all intermittent streams in the Places29 area. The new buffer is proposed because of the importance of streams in the County’s ongoing and future stormwater management efforts, their potential environmental and recreational values (see Water Resources section in Chapter 3 – Existing Conditions and Future Trends), and the ability of the buffered stream corridors to create a network of greenways throughout the area. The network aspect of these buffers is important because appropriate portions of this network may be included in the County’s system of Greenways, which would have both transportation benefits for pedestrians and bicyclists as well as potential environmental benefits through the linking of habitats.

A new Stream Buffer designation will need to be added to the County’s water protection ordinance. Necessary updates to this ordinance will also address aspects such as definitions of the expected quality of stormwater management on properties adjacent to intermittent streams, exemptions from requirements spelled out in the ordinance and other details addressed by the ordinance with respect to the current range of required stream buffers.

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13 Non-tidal wetlands are not included in the Map and need to be determined by applicants for development or rezonings.
Forested Buffers along US 29

60 to 100-foot deep, forested landscape buffers are proposed along portions of US 29 north of the Rivanna South Fork, where they will create a separation between the road and new residential development. The depth of the buffer will depend on the topographic conditions along the sides of US 29. Where grade differences between the roadway surface and the adjacent forested buffer exceeds 6 feet, the buffer may be reduced to between 60 and 80 feet in depth (for additional details see Chapter 7 – Unified Design Guidelines). The landscape character of the buffer is intended to closely resemble today’s conditions. Existing views of rural fields will be replaced with enclosed views of forest unless these views are on areas that are unbuildable due to environmental constraints.

The buffers also serve to maintain the present rural character along this segment of US 29, which is that of forest or rural landscapes lining the sides of the corridor. Maintaining this character preserves the visual break that exists today between Neighborhoods 1 and 2 and the Development Areas to the north of the South Fork of the Rivanna River, a condition that is highly valued by Albemarle County’s residents.

Areas with Steep Slopes

The Semi-public Open Space designation also includes contiguous areas with slopes steeper than 25% or clusters of smaller areas with such slopes. The inclusion of this designation in the semi-public open space designation is useful as development on slopes steeper than 25% is limited by County standards, which makes it possible to include these areas in the desired system of Greenways and open spaces. While the implementation of trails or multi-use paths through some areas of steep slopes beyond 25% may be infeasible or cost prohibitive, these areas still have the potential to provide substantial environmental benefits as wildlife corridors and habitat and will provide valuable visual amenity to surrounding residences and businesses.

Future Transportation Network

At one level, the transportation needs in the Places29 area can be defined solely as a supply issue of not having enough capacity on major roadways like US 29, Hydraulic Road and Rio Road. A supply-side approach, while straightforward and easily understood, ignores the complexity of the demand for transportation in the Places29 area and the potential for changing the demand pattern through a modified pattern of development.

The Places29 area consists of places that people not only want to go through, but want to go to. Two elements of urban form exacerbate the above supply/demand interaction. One is the length of the Places29 area and the other is the dispersed nature of commercial land use over the Places29 area. Measured along US 29, the Places29 area is over 10 miles in length. Because of this long length, trips to and from land uses in the southern portion of the Places29 area “look” like “through” trips in the northern portion. Similarly, trips to and from land uses in the northern portion of the Places29 area look like “through” trips in the southern portion.

The dispersed nature of commercial land uses also reduces the effectiveness of transit in serving travel to and from the retail and employment uses since the distance between those uses and the residential areas in Charlottesville and the higher density residential in Neighborhood 1 is long and becoming longer as more commercial development occurs in Hollymead and Piney Mountain. Similarly, the lower density residential pattern in Neighborhood 2, Hollymead, and Piney Mountain reduces the effectiveness of transit service by spreading potential transit users
over a larger land area. Both of these conditions exacerbate the “demand” portion of transportation problems in the area by reducing the effectiveness of alternate modes of travel, which increases reliance on travel by autos.

The supply and demand issues are complicated by US 29 being the only continuous north-south roadway in the Places29 area. As such, at one point or another, nearly all traffic in the Northern Development Areas winds up on US 29 regardless of the length or destination of the trip. Additionally, US 29 serves a relatively small number of trips that are passing through Albemarle County, and even though their proportion is small they are important trips from a regional and state perspective.

Accordingly, both supply and demand issues have to be addressed to develop a transportation framework for Places29. In that context, the future transportation framework has to consider a more robust network of roadways capable of supporting multimodal travel in combination with an urban structure that encourages transit, walking, and bike use. This is not to say that Places29 will not continue to be a place that people will drive in. Rather, the transportation framework needs to expand the choices for movement within and through the area, while the pattern of development is organized to take advantage of and facilitate those expanded choices.

**Assessment that Led to the Master Plan Recommendations**

The process used to develop the transportation framework for Places29 considered several elements:

- The urban structure (land use patterns and built form) of the corridor
- The potential for the corridor to accommodate future growth
- How the current traffic operations on US 29 influence travel patterns
- Potential roadway improvements on US 29 and parallel to it
- Potential future roadway connections in and to Places29

The process started by building upon a foundation of previous studies, which included the following:

- Existing land use plans and developments already approved and in consideration for the corridor
- The Neighborhood Model (NMD) adopted by Albemarle County that guides future land use planning in the County portion of the corridor
- Programmed and under construction roadway projects in the corridor
- Previous studies of the US 29 North Corridor (North Grounds Connector Study, Route 29 Pedestrian Study, material for the Western Bypass, traffic impact studies for Albemarle Place, North Town Center, North Pointe and Hollymead Towncenter)
- The United Jefferson Area Mobility Plan (UnJAM), which is the regional transportation plan
- The Charlottesville Transit Improvement Study
- The 29H250 Intersections Study

These previous studies provided three major building blocks for the transportation framework: 1) they identified a variety of network elements that had been considered, 2) they indicated how the
general pattern of future development needed to occur, and 3) through the 29H250 study, they defined a strategy for addressing movement and future land uses in the corridor.

The process continued through a series of technical analyses that first evaluated conditions of existing systems in the corridor and then looked at the future trends in the corridor for growth and transportation. The future trends analysis was used to develop the possible range of urban structure alternatives and to suggest network alternatives.

The interaction between the network and the urban structure required an iterative process to be used to develop transportation frameworks. A series of network possibilities were developed and compared with the possible urban structure alternatives. The result was the identification of three primary framework alternatives. In addition, several network variations were identified that were flagged as elements that would be evaluated for only one of the Frameworks.

The alternatives were analyzed to determine the growth capacities of each and forecasts of future daily traffic volumes for 2025 were calculated for each alternative and network variant. The alternatives and the initial evaluation results were presented to the public in a series of workshops. From the workshop results, the alternatives were refined and a preferred alternative was developed.

The Preferred Alternative was evaluated in more detail to determine its effect on peak period traffic operations. Forecasts of daily volumes were developed for an additional set of network variants and the potential ridership for transit was evaluated. The analyses and an additional public workshop series were used to refine the Preferred Alternative to the Recommended Framework Plan.

Each of the above steps and findings are discussed briefly in the sections below.

**Synopsis of Alternatives Analysis**

The 29h250 Intersections Study effectively defined a strategy for untangling the “to” and “through” traffic by combining selected improvements to US 29 with improvements to a network of parallel and connecting streets. The 29h250 strategy:

- Highlighted the relationship between local and regional traffic on the US 29 North Corridor and illustrated the benefit of providing separate facilities for shorter distance trips in the corridor to protect capacity on US 29 for longer distance trips
- Illustrated the value of selected interchange improvements to reduce delay and to extend the useful life of the current facility as well as to provide for effective bicycle and pedestrian crossings of US 29
- Illustrated the value to the primary system of adding streets in the secondary and local systems
- Illustrated that opportunities for development and redevelopment and transit readiness were enhanced by the network of parallel local roads
- Established US 29 as an urban expressway supported by a network of parallel and perpendicular local streets

The strategy works by recognizing that adding capacity for through traffic on US 29 is, by itself, not sufficient to resolve the long term problems in the corridor. Rather, it is a combination of improvements to US 29 and to the parallel and connecting network that is needed. This
combination of on- and off-US 29 improvements provides for more uniform operating conditions on US 29 and addresses the long-term issues by providing a network of streets that allows the pattern of development to evolve in ways that are more supportive to the role of US 29 in the regional network while providing for local trips on the parallel network.

This strategy also identified initial approaches to the issues of urban form and alternate modes for the entire Places29 area. The parallel network improvements encourage patterns of development that focus centers on the parallel and connecting roadways. These roadways are more transit-ready and supportive of bicycling and walking for shorter trips than concentrating development on US 29 alone.

Another aspect of this strategy is one of affordability in that the improvements both to US 29 and to the parallel network are not needed all at once and can be implemented over time as development and growth occur in the corridor.

Three sketch frameworks were constructed to test the effects of organizing the centers and neighborhoods in different configurations to achieve the proper balance between land use activity and travel patterns in the corridor. The land use and urban form concepts initially developed to test urban structure are the following:

- Sketch Framework A – A linear “single-sided” development pattern (similar to the existing pattern) that focused development on US 29
- Sketch Framework B – A pattern that distributed centers along parallel routes rather than on US 29 and that included a concentration of development in a Midtown near Rio Road
- Sketch Framework C – A pattern that clustered centers around the connecting roads to US 29 and that included a concentration of development in an Uptown near Airport Road

The extension of the 29h250 network strategy to the northern portions of the corridor led to a set of roadway concepts that focused on network connectivity. Network connections and extensions identified in the UnJAM Plan (Meadow Creek Parkway, Hillsdale Drive extended, Berkmar Drive extended, Northern Free State Road and an Eastern Connector) and a number of roadways in the corridor to be constructed as part of approved development were used as the basis for developing the network concepts. Independent of UnJAM, a concept for a Ruckersville Parkway was also considered, as were new roadway connections not included in previous plans. The following ten network concepts were initially explored:

- Concept 1 – Existing network with Meadow Creek Parkway and Hillsdale Drive extended from Greenbrier Road to Hydraulic Road including all roadways expected to be built as part of approved private development
- Concept 2 – Concept 1 with all long range plan improvements included except Northern Free State Road and the Eastern Connector (adds Berkmar Drive Extended)
- Concept 3 – Concept 2 without the widening of US 29 to six lanes from the south fork of the Rivanna River to Airport Road (except where already constructed)
- Concept 4 – Concept 1 plus Northern Free State Road
- Concept 5 – Concept 4 plus the East Side Parkway concept
- Concept 6 – Concept 1 plus the Ruckersville Parkway bypass
Concept 7 – Concept 5 plus widening of US 29 to six lanes from the south fork of the Rivanna River to Lewis and Clark Road

Concept 8 – Concept 6 plus widening of US 29 to six lanes from the south fork of the Rivanna River to Lewis and Clark Road

Concept 9 – Concept 2 plus the Eastern Connector

Concept 10 – Concept 2 plus the Eastern Connector plus Northern Free State Road

The East Side Parkway noted in Concepts 5 and 7 is not the Eastern Connector from the UnJAM Plan; rather it is a north-south roadway parallel to US 29 that roughly follows Meadow Creek Parkway/Northern Free State Road/Proffit Road. The Eastern Connector, as noted in the UnJAM Plan, is a potential east-west connection from the US 29 to US 250 east of Charlottesville.

The ten concepts were reviewed in the context of forecasts prepared for the UnJAM Plan and those prepared for the Places29 Master Plan. This review resulted in the following decisions:

- The Eastern Connector represented a potential connection that would likely be made beyond the 20-year planning horizon of the US 29 North Corridor Study and would be treated as a network variant for the Preferred Alternative that would be prepared both with and without the Northern Free State Road connection. The forecasts would be used to illustrate the effect of the Eastern Connector.

- The East Side Parkway, which was developed as a symmetrical counterpart to a Ruckersville Parkway concept, would require extending roadways outside the development area boundaries. The magnitude of such an extension on the east side of US 29 was deemed to be deleterious to the overall concept of the development areas and was dropped from consideration.

- The widening of US 29 from Polo Grounds Road to Towncenter Avenue, the extension of Berkmar Drive across the south fork of the Rivanna River to Hollymead, and Northern Free State Road were all determined to sufficiently affect the future traffic forecasts to a degree that these elements needed to be tested at the level of an alternative.

- Conversely, the widening of US 29 from Airport Road to Lewis and Clark Road did not appear to have such an affect on the traffic forecasts and was not included in the initial alternatives.  

- While important to model from a corridor traffic perspective, the Ruckersville Parkway concept was determined not to warrant treatment as a separate framework alternative and was treated as a network variant of the framework alternative most likely to support that roadway.

When the above results were combined, the ten network concepts were winnowed down to three primary network alternatives and one variant. The sketch framework concepts were used as the basis for developing urban structures around each of the resulting three networks to develop combined land use and transportation alternative frameworks. The three Alternative Frameworks included varying combinations of roadway improvements parallel to US 29, interconnection of local streets, cross connection of internal access roadways and to a degree, driveway.

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14 The widening of US 29 north of Airport Road was modeled as part of the Preferred Alternative analysis.
consolidation through access management\(^\text{15}\). In addition to the street network, expansion of the transit system and enhancement of non-motorized travel modes was considered as part of each alternative Framework. Providing bicycle and pedestrian infrastructure to help facilitate short distance trip-making is a common theme shared by all three alternatives. Transit-ready street and development patterns are also common among all the alternatives. In addition to the three Framework alternatives, a network variant of Alternative 3 was studied during the evaluation process. This variant, labeled 3B, used the land use and urban form of Alternative 3, but added an upgraded Ruckersville Parkway on the west side of US 29 in place of an extension of Berkmar Drive. In general, the three frameworks tested three different urban structures and four different networks:

- A linear “single-sided” development pattern (similar to the existing pattern) in Alternative 1
- A road network that focused traffic on US 29 by widening US 29 to Lewis and Clark Road and minimizing new parallel routes between the northern and southern portions of the corridor in Alternative 1
- A pattern that distributed centers along parallel routes rather than on US 29 and that included a concentration near Rio Road (Midtown) in Alternative 2
- A road network that distributed traffic over a symmetrical parallel network by extending Berkmar Drive and Northern Free State Road into the northern portion of the corridor, adding an parallel local streets through Forest Lakes and not widening US 29 south of Hollymead in Alternative 2
- A pattern that clustered centers around the connecting roads to US 29 and that included a concentration near Airport Road (Uptown) in Alternative 3
- A one-sided parallel road network that focused traffic on the local road network on the west side of US 29; Alternative 3A considered Berkmar Drive extended (as both a two and four-lane street), while Alternative 3B looked at the Ruckersville Parkway concept

Alternative 1 included a Rapid Bus (higher quality buses, improved transit stops) on US29 with stops located about one half mile apart, near key centers and supplemental local service. A concept of two routes was illustrated that showed one line on US 29 that would connect the UVA campus and the UVA Research Park in Hollymead and a second line that would provide service on the parallel road network and US 29, connecting to Downtown Charlottesville.

Alternative 2 included Bus Rapid Transit (BRT) (higher-quality service than Rapid Bus: faster travel times, ticketing at stations, priority movement on streets) that would connect Centers along the parallel routes. A concept of two routes was illustrated with one line that would connect to Downtown Charlottesville and primarily serve the east side of US 29 and a second line to the UVA campus that would serve primarily the west side of US 29.

Alternative 3 would have BRT or street car similar to Alternative 2, also with two routes. One line on the parallel road network that would connect to Downtown Charlottesville; and a second line mainly on US 29 that would provide a more rapid connection from Charlottesville and UVA

\(^\text{15}\) Refer to the Access Management Strategy for a detailed discussion of the approach to access management recommended for the US 29 North Corridor
to Airport Road, the proposed Uptown, and the concentrations of employment at the UVA Research Park, NGIC, and GE-Fanuc.

**Projections of Future Traffic**

Choosing a future Framework from the alternatives required a multi-faceted approach. Various aspects of the alternatives were quantified so that numerical comparisons could be made. These aspects included the growth potential, in terms of capacity and market economics, land use mix, open space and extent of greenfield vs. redevelopment for each and the future levels of traffic on roadways. Other aspects of the alternatives were evaluated qualitatively. These aspects included the connectivity of the transit, pedestrian, and bicycle networks, and stormwater systems.

The growth potential for each of the alternatives was determined through an analysis of the proposed land use and urban form, which was benchmarked against an evaluation of economic market conditions and the regional growth allocation for 2025 from the state demographer. The land use and urban form analysis evaluated a range of single and multi-family residential densities, building floor area ratios (FAR) and mix of retail and service commercial and employment. The result was a detailed forecast of dwelling units and commercial square footage.

From this forecast of space, absorption over time was evaluated in light of the future growth allocated to the region and estimates of households and employees were made to allow the travel demand forecasts to be prepared. The household and employment forecasts are also included in the Appendix. Analyses were also made of the relationships in each alternative among the total development capacity, how much would be absorbed by 2025, how much of that was already committed in approved and under consideration (pipeline) development.

Future demand on the transportation system was estimated for a 20-year planning horizon using a focused version of the regional travel demand forecasting model that calculates future traffic demand on roadway segments on the basis of projected employment and households in the region. The focused model was calibrated using existing counts and census data about trip making in the Charlottesville region. The traffic volumes for the alternatives and the Ruckersville Parkway variant are compared to the UnJAM 2025 volumes in Table 5.4.
Table 5.4. 2025 Traffic Volumes for Framework Alternatives

<table>
<thead>
<tr>
<th>Roadway/Segment</th>
<th>Alt. 1</th>
<th>Alt. 2</th>
<th>Alt 3A</th>
<th>Alt 3B</th>
<th>UnJAM(a)</th>
</tr>
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<td><strong>US 29</strong></td>
<td></td>
<td></td>
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<tr>
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<td>85,200</td>
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<td>16,900</td>
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<tr>
<td>Rio West to Hilton Heights</td>
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<td>18,400</td>
<td>10,800</td>
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<td>west of Commonwealth</td>
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<tr>
<td>south of Rio East</td>
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<td>22,300</td>
<td>20,300</td>
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<td><strong>Northern Free State Road</strong></td>
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<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
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<td>17,000</td>
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<td>US 29 to Carrsbrook</td>
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<td>36,800</td>
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<td></td>
</tr>
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<td>Hydraulic to Berkmar</td>
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<tr>
<td><strong>Ruckersville Parkway</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>US 250 to Barracks</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>12,600</td>
<td>N/A</td>
</tr>
<tr>
<td>Barracks to Hydraulic</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>12,600</td>
<td>N/A</td>
</tr>
<tr>
<td><strong>Notes</strong></td>
<td></td>
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<tr>
<td>(a) UnJAM approved network includes Berkmar Drive Extended, but does not include Northern Free State Road</td>
<td></td>
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</tr>
<tr>
<td>(b) N/A means road does not exist in this Alternative</td>
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</tbody>
</table>
Figure 5.30 A shows a graphic comparison of the daily traffic volumes from the alternatives and the variant. The alternatives have the following future traffic volume patterns:

- **Alternative 1**
  - Highest traffic volumes on middle and northern segments of US 29, particularly in the middle segment near Polo Grounds Road.
  - Volumes on southern segment of US 29 similar to other alternatives
  - Lowest use of parallel network by corridor traffic

- **Alternative 2**
  - Lowest traffic volumes on middle segment of US 29 near Polo Grounds Road.
  - Volumes on other segments of US 29 equivalent to or slightly higher than Alternative 3 volumes
  - Most use of parallel network by corridor traffic

- **Alternative 3**
  - Lowest traffic volumes on northern and southern segments of US 29, but volumes in middle segment near Polo Grounds Road higher than Alternative 2.
  - Use of parallel network by corridor traffic less than Alternative 2, but higher than Alternative

- **Alternative 3B**
  - Volume pattern in the northern segments of US 29 similar to Alternative 3, but volumes in the middle segment near Polo Grounds Road are similar to Alternative 1.
  - Ruckersville Parkway would carry volumes similar to Dickerson/Earlsville Roads in the other alternatives. Overall, the Ruckersville Parkway would carry less traffic that the combination of Berkmar Extended and Dickerson/Earlsville Roads in Alternative 3.

The future traffic volumes were used to prepare an analysis of traffic operations for the Alternative Frameworks. The operations evaluation of alternatives indicated the following:

- At least one parallel roadway that is reasonably close to US 29 is needed to connect the northern and southern portions of the corridor\(^{16}\) to provide for effective separation of local and regional traffic.

- The Ruckersville Parkway concept would not attract a sufficient amount of traffic to reduce the need for additional widening on US 29.

- Berkmar Drive Extended would attract enough traffic to allow the six-lane cross section to function on US 29.

- Combining Berkmar Drive Extended with the Northern Free State Road connection in Alternative 2 would result in the lowest volume on US 29 in the future at the crossing of the South Fork of the Rivanna River.

\(^{16}\) This finding is consistent with and reinforces the findings of the UnJAM study for Berkmar Drive Extended.
Figure 5.31: 2025 Daily Traffic Volumes at Polo Grounds Road Screenline

- The four-lane section of US 29 south of Hollymead would need to be at least eight lanes under Alternative 1, six lanes under Alternatives 3 and 3B and could remain at four lanes under Alternative 2.
- The 29H250 improvements recommended for US 29 at the US 250 Bypass and Hydraulic Road would be required in all three alternatives.
- An interchange would be required at Rio Road to allow traffic to operate effectively in the southern half of the corridor.
- The need for additional interchanges at Greenbrier Road, Timberwood Boulevard and Airport Road is evident under Alternative 1, but is less clear under Alternatives 2 and 3.
- Widening US 29 north of Airport Drive appears to be necessary in Alternative 1 and likely in the other two alternatives.
- The current pattern of access to US 29 needs to be managed to reduce the numbers of driveways and intersections present in the southern portion of the corridor and to limit the numbers of new driveways in the northern portion of the corridor.
- Pedestrian and bicycle crossings of US 29 would not be supported by conventional intersection design because of the need to maintain the large numbers of through and turn lanes on US 29.

A preferred alternative framework and network were selected through a series of public workshops. The findings from the workshops indicated the following:

- Alternative 1 was the least desirable - too much focus on US 29
- Alternative 2 was best in the southern portion of the corridor, while Alternative 3 was best in the northern portion of the corridor
- The Major Centers should be primarily oriented to parallel and perpendicular roads
- The size of the Uptown near Airport should be reduced
- The Centers around Rio Road and US 29 should be reconfigured to provide a looping road network around the interchange, to intensify Albemarle Square, and to make the Midtown a Mixed-Use Center
• Neighborhood Service centers should be dispersed to serve local community needs
• Employment uses should be concentrated in the northern area with some clusters south of the river
• Up to 20% of projected new growth should be via redevelopment in the southern portion of the corridor
• Clusters of mixed use and employment centers should establish target areas for transit and these areas should be planned as mixed use and transit ready

The preferred alternative was constructed by combining elements of Alternative 2 and Alternative 3 and adjusting the overall distribution of land uses and centers. Refinement of the transportation network was accomplished through a series of detailed analyses. The growth potential was calculated for the Preferred Framework and another forecast of future traffic volumes was made using the forecast model. During this part of the analysis, several variants were evaluated that considered the impacts of using lower speed designs on the parallel road network, whether Berkmar Drive Extended should be two or four lanes, and not including Northern Free State Road in the network. The Eastern Connector concept was evaluated for several different points of connection to the US 250 Bypass.

The forecast volumes were used to develop morning and evening peak-hour turning movement volumes for 2025, which were used in an analysis of traffic operations in the corridor. The traffic operations analysis evaluated projected conditions at all the intersections in the corridor and was used to develop the lane patterns, signalization and turn storage requirements. This information was further analyzed using a traffic simulation model of the corridor that was calibrated to reflect existing travel times and queuing. From the simulation analysis, refinements to the roadway requirements were identified. The resulting findings were used to develop a roadway design for the corridor. The analyses indicated that most of the major intersections in the northern portion of the corridor would require signalization by 2025.

During the operations and simulation analyses, specific design studies, similar to 29H250 study of Hydraulic Road, were conducted in the areas around Rio Road, Airport Road/Timberwood Boulevard, Hilton Heights Road and Ashwood Boulevard. These design studies evaluated the impacts and functionality of alternate interchange designs.

At Rio Road, a series of full and partial interchange concepts was evaluated. The most promising candidates were a single-point urban interchange (SPUI) similar to the design recommended for Hydraulic Road and US 29 and a crossover accessed from US 29 via the “ring road” network. In all cases, Rio Road was taken over US 29 because the intersection (as with Hydraulic) is at the crest of a vertical curve on US 29. By depressing US 29, US 29 becomes a flatter roadway and there is less overall excavation. Putting Rio under 29, since Rio is largely at a common elevation from Berkmar Drive to south/east of Mall Drive, would cause a longer run of excavation on Rio—potentially from west of Berkmar Drive to east of Mall Drive and may cause those intersections to be moved further away from US 29. The ring road configuration was chosen over the SPUI to allow the intersection of US 29 at Albemarle Square to remain a full access. With a SPUI, there would be full access to Rio Road, but the intersection at Albemarle Square would be interrupted by the ramps and would be become right-in/right-out only similar to Zan Road. The ring road would support redevelopment in the Rio Road/Midtown area better than a SPUI. The SPUI would provide for direct southbound to eastbound traffic access, whereas the ring road requires a more circuitous pattern of movement. Analysis of the 2025 volumes with a SPUI indicated that the interchange would operate in acceptable conditions. The SPUI remains a viable
option and serves the transportation function without as much support for surrounding land use change.

At Timberwood Boulevard and Airport Road, the cross over design was evaluated against a split diamond and SPUI configurations. Further into the future, signal operation at Airport Drive and Timberwood Boulevard would reach unacceptable levels, partially as a result of the close proximity of these two intersections. The inability to clear queues between the two intersections under heavy volume demands is a primary contributor to poor future conditions. The close spacing also precludes a SPUI configuration, since there is not sufficient room between the intersections to develop ramping for both locations. This led to the consideration of two types of interchanges – a split diamond, where a set of (typically one-way) frontage roads would be required between Airport Road and Timberwood Boulevard, and the cross over design with shared jug-handle roadways. The frontage road requirements and ramping necessary for a split diamond would have a substantial impact on development adjacent to US 29. Partial access was also considered, but the resulting diversion of traffic to adjacent locations resulted in those locations failing in the future. Consequently, the grade separations with jug-handle access roads was selected since that design meets traffic demands and provides an unencumbered crossing for bicycles and pedestrians as well as access across US 29 for automobile traffic.

For Hilton Heights and Ashwood Boulevard, the cross over design with jug-handle access roads were evaluated against expanded at-grade intersections. While both of these intersections would function as at-grade signalized locations into the future, the numbers of turn lanes necessary to make the intersections operate at acceptable levels in the future are excessive. Neither Hilton Heights nor Ashwood are major roadways since each has a limited connectivity with the rest of the network. The cross over design would minimize the cost to grade separate US 29 at these locations. Additionally, Ashwood Boulevard is the sole intersection in the rural, rolling terrain section between Hollymead Towncenter and Polo Grounds Road. Eliminating the at-grade median break and signal improves operations and safety on US 29 and the grade separation provides an unencumbered crossing for bicycles and pedestrians as well as access across US 29 for automobile traffic. The jug-handle roadways provide opportunities to consolidate access driveways along US 29 in both locations.

A separate analysis was prepared for the Berkmar Bridge concept to identify the probable length of span over the river, the range of touchdown points at either end and the general envelope of the area affected by the bridge. While not a formal location/design study, this information was useful in identifying probable cost and impacts of the bridge. Because of the need to maintain a minimum height above the river, the analysis determined that a direct connection to Rio Mills Road would not be feasible without substantially altering the profile of Rio Mills Road. Designs were identified that could reduce the length of the crossing, but were found unacceptable because of wetland/flood plain impacts.

### Future Transportation Network

The Transportation Network, as illustrated in Figure 5.32, is made up of the following layers:

- Improvements to US 29, which include improvements on parallel and connecting roads that are necessary to support the changes on US 29 (primarily in the areas where grade separations are recommended)
- Improvements to a core network of parallel roads (primarily Hillsdale and Berkmar Drives, Meadow Creek Parkway and North Pointe Boulevard/Leake Lane) that are needed independent of private development projects
• Roadways necessary to support private development in the corridor that should be integrated into the corridor network to provide for continuity of movement
• Roadways projected to be needed beyond the 2025 planning horizon.

In addition to the roadway shown in Figure 5.32, the network includes the following provisions for multi-modal travel:

• Three types of transit service – a BRT system on US 29 that first connects to the Midtown at Rio Road and later extends to the Uptown near Airport Road with tails that serve the airport and the employment concentrations near Boulders Road. The BRT service would be supplemented with circulator service that connects to centers on the parallel road system. The circulator service would integrate with local CTS bus routes in the southern portion of the Places29 area.
• Sidewalks and paths for pedestrians – a network of conventional sidewalks and shared paths is integrated into the roadway network (see discussion of cross sections below). Provisions for crossing US 29 are included via signalized crosswalks and grade-separations at key intersections.
• Bicycle lanes, paths and trails – through a system of green infrastructure that is integrated with the framework, a network of multi-use paths and trails is linked with on-street bicycle lanes to provide for a connected system of bicycle travel (see discussion of bicycles and pedestrians below).

**Roadway Elements**

The transportation network for the portion of Places29 between the US 250 Bypass and the South Fork of the Rivanna River would introduce grade-separations at Hydraulic Road, Rio Road and Hilton Heights Road. The interchange at Hydraulic would have on- and off-ramps in all four quadrants, while the interchange at Rio would only have on-ramps from Rio to US 29 in two quadrants with the other two quadrants being served by a “Ring Road” configuration of roads around the intersection. Circulation in the Rio Road area would be accomplished with a “Ring Road” that would intersect with US 29 at the existing signalized intersections at Albemarle Square and Shoppers World. At Hilton Heights Road, access to the over-crossing would be via “jug-handle” roadways that would access US 29 via right-in/right-out movements. Parallel roadways in this segment are Berkmar Drive, Cedar Hill Drive and Hillsdale Drive, portions of which currently exist. The transportation network would extend these roadways to provide a more complete network parallel to US 29.

For the portion of Places29 from the South Fork of the Rivanna River to Hollymead Towncenter, the transportation network would introduce a grade-separation at Ashwood Boulevard that would be accessed via jug-handle roads. US 29 would be widened to three lanes in each direction, but would preserve the rural cross section. A parallel road would be added on the west side of US 29 via an extension of Berkmar Drive with a connection across the South Fork of the Rivanna River on a new Berkmar bridge.

For the portion of Places29 from Hollymead Towncenter to Lewis and Clark Drive, two existing signalized intersections on US 29 would be replaced by grade-separations at Airport Drive and Timberwood Boulevard. A signal would be added on US 29 at the Airport Acres North intersection. The over-crossings at Airport Road and Timberwood Boulevard would be served by new right-in/right-out jug-handle connections and the existing partial access intersection at Worth Crossing. Leake Lane on the east side and a new parallel road on the west between Airport Acres
South and Timberwood Boulevard would link to the jug-handle connectors. North Pointe Boulevard would provide a new parallel road on the east side of US 29. The roadway network in the Uptown would be expanded to increase connectivity on the west side of US 29. A signal would be added on US 29 at the intersection of Northside Drive. The six-lane cross section on US 29 would be extended through Lewis and Clark Drive, but would transition back to the existing four-lane cross section at the river crossing.

For the portion of Places29 north of Lewis and Clark Drive, signals would be introduced on US 29 at Austin Drive, Dickerson Road and Burnley Station Road. The cross-section of US 29 would remain at four-lane rural divided, except near the signalized intersections where turn lanes would be necessary.

The future concept for this segment would introduce a grade-separation at Ashwood Blvd that would be accessed via jug-handle roads. US 29 would be widened to three lanes in each direction, but would preserve the rural cross section. A parallel road would be added on the west side via an extension of Berkmar Drive.

**Transit Elements**

The transit improvements recommended for Places29 are shown in Figure 5.33. Two types of service are included in the recommended network. One service type would be BRT or ultimately LRT that would operate on US 29 and would provide a rapid connection from Charlottesville and UVA to Airport Road, the proposed Uptown, and the concentrations of employment at the UVA Research Park, NGIC, and GE-Fanuc. Widely spaced stops would be provided at Hydraulic Road, Greenbrier Road and on either side of the proposed Midtown adjacent to Rio Road. This rapid service would be supplemented with local circulator routes that would operate either as bus or street car. One of the two circulator routes would operate on the parallel routes on either side of US 29 in the area between Hydraulic Road and Albemarle Square, generally following Hillsdale Drive and Cedar Hill Road. The other circulator route would operate in the Hollymead area connecting North Pointe and the proposed Uptown with Hollymead Towncenter.

The transit network could be implemented in two phases. The initial phase would extend as far north as the Midtown at Rio Road. The second phase would extend to the Uptown at Airport Road. The Hydraulic to Albemarle Square circulator service could initially be an extension of the CTS routes that operate in the southern portion of the Places29 area today, whereas the route in the Uptown area would need to be new service.

**Bicycle and Pedestrian Elements**

A strong pedestrian and bicycle-oriented infrastructure, which connects neighborhoods and centers is a critical component of creating a healthy and livable community. Providing multi-use paths, trails and bikeways encourages Places29 area residents to complete more of their trips without getting into their cars, resulting in health benefits as well as a reduction of vehicular miles traveled (VMT) and a cleaner environment for the community. The bicycle and trails network illustrated on the Green Infrastructure Map builds upon the existing and proposed trails in the County’s Greenways Plan, as well as existing on and off-street bicycle facilities, such as bicycle lanes, multi-use paths, and trails.

The principal goal of the overall network of trails and bicycle facilities is to provide viable non-vehicular connections between different parts of the Places29 area. These connections provide safer, more direct, and ultimately more convenient routes to employment, business and educational, destinations. Equally important, this network also provides access to parks and open
spaces located within the Places29 area as well as to important parks, natural areas, and landscapes located in the Rural Areas, such as the North and South Forks of the Rivanna River, Ivy Creek Natural Area, and Chris Greene Lake.

**An Integrated Bicycle and Trails Network**

The bicycling and trails network shown on the Green Infrastructure Map (Figure 5.29 A and B) allows for bicyclists and hikers to travel north and south along routes parallel to US 29. It should be noted that the bicycle facilities and trails illustrated on the Green Infrastructure Map do not include all bicycle facilities and paths within existing and proposed subdivisions and projects (i.e. North Pointe and Belvedere).

West of US 29, this is achieved through a combination of bicycle lanes and multi-use paths along the extensions of Cedar Hill Drive, Berkmar Drive, and Lewis and Clark Drive, stretching almost the entire north to south length of the Places29 area. East of US 29, Hillsdale Extended and the proposed new roadway connections through the Fashion Square Mall, Albemarle Square, and proposed Northtown Center properties allows for a similar approach. However, topographic conditions and already established land uses north of Northtown Center prevent a parallel route from extending further north. Instead, bicycles and pedestrians are routed on a 14-foot wide multi-use path along the east side of US 29. A parallel route is reestablished at Timberwood Boulevard and continues north through the North Pointe area. North of North Pointe, the route returns to the edge of US 29 due to the presence of the North Fork of the Rivanna River and the steep topography along the river’s banks. All multi-use paths along US 29 will be separated from the highway by a 12 to 18-foot wide landscape buffer (see cross sections in Figure 5.34).

Bicycle and pedestrian facilities outside of the Northern Development Areas are not shown on the Green Infrastructure Map, with exception of multi-use paths along Earlysville Road and Proffit Road. These have been included for reference purposes because several Places29 bicycle facilities tie directly into both of these roads.

The bicycling and trails network also includes east-west connections between the north-south routes at regular intervals. These connections often coincide with “perpendicular main streets” through mixed use centers located between US 29 and Berkmar Drive Extended and other parallel road east of US 29. Additional east-west bicycle and trail connections create links to trails along both forks of the Rivanna River, the Ivy Creek Natural Area, and Chris Greene Lake. A multi-use path along the potential future alignment for Northern Free State Road may provide the opportunity to tie into the proposed trail that is intended to loop around the City of Charlottesville and through portions of Albemarle County. Given the regional significance of this trail connection, Chapter 8 – Implementation includes a recommendation to explore the possibility of achieving this trail connection prior to the construction of Northern Free State Road.

**Bicycle Lanes**

The existing and proposed on-street bike lanes are closely integrated with the greater network of bicycle infrastructure formed by a combination of low-speed streets, multi-use paths and trails. Within this overall network, bicycle lanes provide on-street facilities for bicyclists throughout a number of the neighborhoods along US 29. The proposed bicycle lanes shown on the Green Infrastructure Map will enhance the limited network of existing bicycle lanes and accommodate anticipated future increases in bicycle traffic as redevelopment and new development takes place in the area. South of the South Fork of the Rivanna River, bike lanes are added along the major proposed roadways in north-south direction (such as the new parallel route east of US 29 and portions of Berkmar Drive extended). Additional bicycle lanes on existing residential
neighborhood streets such as Northfield and Carrsbrook Roads are intended to collect bicycle traffic from local, low-speed streets and cul-de-sacs and provide a safe cycling environment for individuals less comfortable riding in traffic lanes shared with auto traffic. Similarly, north of the South Fork of the Rivanna River, bicycle lanes are proposed on important roads through Forest Lakes (like Ashwood Boulevard, Timberwood Parkway and Boulevard) and also along proposed north-south roads such as Berkmar Drive Extended (Meeting Street) in the Hollymead Towncenter and North Pointe Boulevard. Several routes of bicycle lanes create direct connections with multi-use paths, which together form the backbone of the bicycle network in the Places29 area.

Bicycle lanes are included primarily along streets with a moderate to high levels of automobile traffic like the portions of streets illustrated by Section 3 (in Figure 5.35). Typically roads with bicycle lanes include one lane for each direction of traffic. Bicycle lanes should have widths of 5 feet next to parking, and 6 feet where no on-street parking is provided. For an example of bike lane configurations with and without parking, refer to Sections 7B and 7A (in Figure 5.36), respectively.

**Multi-Use Paths**

Multi-use paths are a critical component of the Places29 bicycle and pedestrian network. These bidirectional paths simultaneously accommodate pedestrians and bicyclists alike. Multi-use paths are included in the Places29 network primarily along major thoroughfares, such as US 29 and portions of Berkmar Drive extended, where the safe accommodation of pedestrians and bicyclists requires a greater separation from moving traffic and/or where development along the street is dominated by deeper landscaped setbacks and a lower intensity of development, and along major greenways and natural areas. The section of Northside Drive between Dickerson Rd. and Berkmar Extended is an example of a multi-use path along a street that is expected to carry elevated levels of truck traffic. For this reason, bicycles and pedestrians are accommodated on a multi-use path buffered from the road rather than on bicycle lanes and sidewalks (see Section 14B in Figure 5.35). Section 3 (in Figure 5.35) and the photo simulation in Figure 5.37 illustrate the character of the envisioned 16-foot wide multi-use path along the eastern side of sections of US 29. West of US 29 most north-south traveling bicyclists are expected to use the bicycle facilities along Berkmar Drive extended. However, an 8’-foot wide path for shared pedestrian and bicycle use on the west side of US 29 can accommodate bicyclists who wish to travel a shorter distance directly along US 29 without crossing to the wider multi-use path on the eastern side. Pedestrian-scale lighting will be provided along the path on the east side of US 29 in order to create a high level of sense of safety for all users of the facility, which passes through several heavily wooded areas along US 29.

Because of the destinations they serve and the natural character of landscapes they traverse, multi-use paths are expected to be used by both bicycle commuters and recreational bikers and pedestrians. Multi use paths also are important components of the greenways network as they provide alternatives to driving a car to parks and open spaces like Chris Green Lake Park (a County Park) and the Ivy Creek Natural Area. While they typically follow road alignments, in some cases they diverge and provide improved access along natural features, such as the recently completed multi-use path between the Deerwood residential neighborhood and US 29 in Hollymead.

**Trails**

The network of trails shown on the Green Infrastructure Map focuses on providing access to natural areas and features as well as recreational amenities throughout the Places29 area. Routed
along streams and through preserved areas, they allow residents who seek opportunities for passive recreation to escape from the faster pace of urban life. The trails can also function as scenic route segments along pedestrian and bicycle trips to shopping and employment destinations.

In order to facilitate further connectivity for pedestrians and bicyclists, several segments of Class A trails have been added to the trails network in order to provide a closer integration and broader access between greenways and their trails and the remainder of the bicycle and pedestrian network. These trails are designed for pedestrian use but also include an 8-foot wide paved path suitable for bicycle and wheelchair travel. Desired Class A segments are also reflected on the Green Infrastructure Map and generally facilitate a more direct connection between parks and natural areas and neighborhoods or employment centers.

It is recommended to include all proposed trails in the next iteration of the County’s Greenways Plan.

**Pedestrian Elements**

In order to create the type of walkable neighborhoods and centers envisioned by the Neighborhood Model and this Plan (see Chapter 4 – Place Types), it is critical that the future network of roads in the Places29 area be well connected and that each street include appropriate pedestrian facilities. All future roads in the area are therefore required to include sidewalks or multi-use paths in order to accommodate pedestrian travel. The specific proposed dimensions for pedestrian facilities along roads illustrated in Figure 5.35 are discussed in greater detail in Chapter 7 – Unified Design Guidelines.

**Grade-Separated and At-Grade Crossings of US 29**

A critical element to the success of the bicycling and trails network is the ability to cross US 29 safely. The Green Infrastructure Map identifies locations where adjacent grades support the construction of grade-separated bicycle-pedestrian bridges or under-crossings, where grade-separated bridges for all modes are proposed, and where at-grade crossings should be specifically designed to safely guide pedestrians and bicycles across the street.

A pedestrian-bicycle bridge is proposed to connect the east and west side along US 29 in the Midtown area. The topography along the western edge of the Fashion Square mall site supports the construction of such a connection without major structural supports on this side of US 29. On the western side, the needed ramps should be accommodated within a structure that presents a human-scaled façade at the corner of Berkmar Drive and US 29 (similar to that illustrated in the photo simulation in Figure 5.38, and the site plan in Figure 5.4 above).

Bicycle and pedestrian facilities will also be an integral part of any multimodal bridge across US 29, similar to the accommodation of pedestrians and bicyclists shown in Figure 5.39, a single-point urban interchange (SPUI) proposed for the Hydraulic Road/US 29 intersection.

At the two river crossings opportunities exist to route multi-use paths or trails underneath US 29. Figure 5.40 illustrates a well-executed design of such a connection.

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17 With exception of Residential and Commercial Alleys (as per County Neighborhood Model Street Design Standards)
Where pedestrians and bicyclists cross US 29 at at-grade crossings additional pedestrian refuges will be incorporated into the standard US 29 cross section. This condition is illustrated in Figure 5.41.

Cross Sections for Key Network Roads

For the transportation network described above to achieve its multi-modal goals, detailed guidance is needed to integrate the requirements for all transportation modes (walking, bicycling, transit, autos and freight) into the design of the roadway. This guidance is provided in the Urban Design Guidelines and is presented here in terms of a series of typical cross sections that illustrate the relationships among modes and the overall lane requirements for key network roads.

Approach

An approach known as Context Sensitive Solutions (CSS) has developed as a method of balancing the requirements of all modes that use a road and fitting the road with its surroundings. CSS encourages the following goals:

- “Balance safety, mobility, community and environmental goals in all projects;
- Involve the public and stakeholders early and continuously throughout the planning and project development process;
- Use an interdisciplinary team tailored to project needs;
- Address all modes of travel;
- Apply flexibility inherent in design standards; and
- Incorporate aesthetics as an integral part of good design.”

The CSS approach, as applied to Places29, uses a context-based approach to roadway design that is predicated on the concept that the elements of road design should change as the context of the places that a road passes through change. This concept is rooted in the belief that the design of the road and the place-making aspects of the areas adjacent to the road influence each other and that consistency between the two are necessary for successful place-making. Albemarle County’s Neighborhood Model Road Designations and the center and place types from the Framework are the building blocks that form the basis for identifying design elements that are appropriate for reinforcing the character and role of the place and the road through the design process. Within the Framework, roads and place types are definitional elements that are used to articulate how the elements of road design respond to differences in place.

Explanation of Concepts behind Cross Sections

The cross section of a road is grouped into three design zones (traffic, pedestrian and context) that reflect the activity and movement influences along the roadway as shown in the following sketch. There are overlapping influences (indicated at the bottom of the sketch) within the primary zones from the different modes that may use a road (e.g., parking, bicycle and transit design are influenced by both the pedestrian design and the traffic design).

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18 Cite to FHWA CSS resource site
19 Minnesota Department of Transportation from www.cts.umn.edu/education/csd/index.html
Traffic Zone
The traffic zone covers the area for vehicle movement on the road and includes the median/turn area in the center of the road. The median/turn area is used to define the area in the center of the roadway where raised or painted medians and/or turn lanes could be present, either individually or in combination. The traffic zone reflects the various combinations of lane widths and median treatments and illustrates how these elements change as edge conditions vary.

The parking/bicycle/transit zone is adjacent to the pedestrian zone and reflects the interface between the areas of pedestrian movement and vehicular movement. It overlaps the vehicle lanes and the sidewalk areas and represents a zone of activity where vehicles (autos, bicycles, and transit) are moving more slowly than in the travel lanes. While the design zones indicate requirements for bicycles and transit, the provision of bicycle facilities and transit service is determined at the network level. If a road is on a designated bicycle route, then the appropriate level of bicycle accommodation (marked lane, separated path, shared lane) would be added to the cross section. Similarly, if a road is expected to support a particular level of transit service, the Urban Design Guidelines indicate how to accommodate stops and service patterns along the road.

Pedestrian Zone
The pedestrian zone frames the road and contains the building interface between the movement aspects of the road and adjacent land uses. This zone contains the area of pedestrian activity and is divided into four subzones (see sketch to right), the total of which covers the space between the property line and the curb:

- **Frontage Zone** – This zone is the space at the edge of the walkway adjacent to the property line. It reflects the varying level of activity associated with property frontage and is wider where people are likely to window shop. It also reflects the tendency of people to shy away from walls above waist height.

Figure 5.42: The three design zones of a cross section
• **Travel Zone** – This zone contains the basic sidewalk width or clear area for pedestrian travel and is sized to provide for two directions of pedestrian travel on the walk.

• **Furnishings Zone** – This is an amenity zone that contains planting terraces, tree wells, planters and space for sidewalk furniture.

• **Edge Zone** – This zone is closest to the curb and reflects the setback required from the roadway, which varies from back of curb to the required clear distance of 1.5 feet along arterials.

**Context Zone**
The context zone is the area adjacent to the roadside and, depending upon the urban structure, incorporates a range of built and natural environments that can include social, economic and historical aspects.

**Applicability of Context Illustrated in Cross Sections**
The cross sections have been diagrammed to illustrate nominal dimensions for traffic, parking and bike lanes and sidewalks and paths. Landscape strips, setbacks and frontage types are also indicated on the diagrams. Setbacks and frontage types are intended to be illustrative and are determined by zoning and the framework plan on a parcel by parcel basis.

The dimensions shown on the cross section diagrams are intended to reflect average conditions and may vary depending upon the right-of-way available on a specific roadway. Turn lanes and parking bays are shown on the diagrams to illustrate how these roadway elements fit into the cross section. Not all locations will have the same elements as shown on the example sections. The Urban Design Guidelines provide specific guidance as to dimensions and how various elements of the cross section may be adjusted or removed to address constrained conditions.

**Relationship of Cross Sections to VDOT and County Standards**
Public roads in Virginia are identified as being part of the primary system or the secondary system of roadways, both of which in Albemarle County are under the jurisdiction of the Virginia Department of Transportation (VDOT). Primary roads connect cities and towns with each other and with interstate highways, while secondary roads are local connector or county roads. VDOT regulates the design of roadways in the primary system through its Road Design Manual and for secondary roadways through the Subdivision Street Requirements.

**County’s Neighborhood Model Street Design Standards**
Albemarle County’s Neighborhood Model (NM) introduces a series of street types that are more specifically related to the neighborhood scale and are currently being considered as an alternate set of design requirements for those contained in the Subdivision Street Requirements. The NM road designations (shown in Table 5.5) add street types (boulevards, avenues, lanes, and alleys) to the arterial/collector/local system used by VDOT to account for different functions. The NM road designations generally reduce lane widths and place more emphasis on slower speeds.
### Table 5.5: Neighborhood Model Road Designations

<table>
<thead>
<tr>
<th>Street Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boulevard</td>
<td>Multi-lane thoroughfare that may include a center median to create linear park appearance. Bike lanes are generally provided. Parking lanes may be separated from the travel lanes with medians on both sides. Generally intended for Centers and an edge condition between adjacent neighborhoods.</td>
</tr>
<tr>
<td>Avenue</td>
<td>Two-lane thoroughfares that connect to important places and/or spaces in Centers; may serve mixed-use areas, function as a &quot;main&quot; street. Parking lanes are provided and diagonal parking may be allowed with the appropriate width. Bikes lanes are generally provided unless determined not applicable. Avenues may include a center median to create linear park appearance. Intended for Centers and General Areas.</td>
</tr>
<tr>
<td>Street</td>
<td>Neighborhood &quot;Street&quot;; local slow-movement thoroughfare that is urban in character and the street is considered a &quot;shared&quot; space. On-street parking is permitted (intermittent or delineated). Intended for Edge, General Areas, Centers and transitions from residential to mixed-use areas.</td>
</tr>
<tr>
<td>Lane</td>
<td>Narrow very slow-traffic street where &quot;yield&quot; movements are intended and the street is considered a &quot;shared&quot; space. Intermittent on-street parking is permitted. Intended for Edges and General Areas with limited use in Centers.</td>
</tr>
<tr>
<td>Alley</td>
<td>Narrow accessways at the rear of lots to service areas; garages or designated parking. &quot;Yield&quot; movements are intended. Accessways are curbed unless pavement extends to the walls of adjacent structures. Residential alleys are intended for Edges and General Areas. Commercial alleys are intended for Centers.</td>
</tr>
</tbody>
</table>

This alternative classification system reflects the diverse and more specific conditions of the Neighborhood Model and the County’s Development Areas. It is organized vertically to reflect facilities that serve longer distance trips at the top. The types descend to reflect more local, lower speed and more pedestrian-scale facilities at the bottom. The street types emphasize characteristics that serve a distinct function and can also be differentiated for a variety of center types. The street type names are distinct, such that the meaning of the name conveys the characteristics of the roadway.

**Description of Cross Sections**

The proposed cross sections for roads in the Places29 area other than US 29 generally fall into two categories – two-lane roads and four-lane roads. For US 29, there are three general cross sections – four-lane, six-lane and eight-lane. Collectively, when the various combinations of urban (curb and gutter) or rural (side swales) drainage, medians and turn lanes and bicycle and pedestrian facilities are applied, about 25 different conditions are represented. Figure 5.43 shows the proposed cross sections in relation to the transportation network. Examples of the US 29 cross...
sections are shown in Figure 5.34. Figure 5.36 shows examples of four-lane roadway cross sections and Figure 5.35 shows examples of two-lane roadway cross sections.

**US 29**

US 29 would continue to be a multi-lane principal arterial with a modified boulevard design that articulates between urban and rural cross sections as it traverses the Places29 area. The following cross sections would occur along US 29 within the Northern Development Areas:

<table>
<thead>
<tr>
<th>Segment</th>
<th>Basic Cross Section</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydraulic Road to Polo Grounds Road</td>
<td>Eight through lanes with median, no on-street parking or bike lanes, urban drainage; sidewalk on one side of the roadway, multi-use path on the other. Cross Section A in Figure 5.34 shows this condition.</td>
</tr>
<tr>
<td>Polo Grounds Road to Hollymead Towncenter and Airport Drive to the North Fork of the Rivanna River</td>
<td>Six lanes with wide median, no on-street parking or bike lanes, rural drainage; pedestrians and bicycles on paths adjacent to the roadway. Cross sections B and E in Figure 5.34 illustrate this condition</td>
</tr>
<tr>
<td>Hollymead Towncenter to Airport Drive</td>
<td>Six lanes with median and right turn lanes, no on-street parking or bike lanes, urban drainage; sidewalk/path on one side of the roadway, multi-use path on the other. Cross Section C in Figure 5.34 shows this condition.</td>
</tr>
<tr>
<td>North of the North Fork of the Rivanna River</td>
<td>Four lanes with wide median, no on-street parking or bike lanes, rural drainage; multi-use path on one side of the roadway. Cross section F in Figure 5.34 illustrates this condition</td>
</tr>
</tbody>
</table>

Table 5.6: Overview of applicable US 29 cross sections

**Four-Lane Roadways**

Four lane roadways are generally, but not always, boulevards with center medians, provisions for bike lanes and sidewalks in urban areas. In rural areas, bicycles and pedestrians are served by multi-use paths adjacent to the roadways. On some roads, the median is a two-way left turn lane. The example roadways and cross sections are each described separately below.

**Rio Road East**

Rio Road east of US 29 to Meadow Creek Parkway would continue as a four-lane boulevard with center turn without parking, but with on-street bike lanes and sidewalks on both sides of the roadway. Landscape strips would separate the sidewalks from the roadway. Cross section 1A in Figure 5.36 illustrates this condition. Portions of this segment of roadway would have an access lane adjacent to Rio Road which would relocate the sidewalk to the outside of the access lane on one side of Rio Road.

**Hydraulic Road and Rio Road West**

Hydraulic Road and Rio Road west of US 29 would continue as four-lane boulevards with center turn lanes without parking, but with on-street bike lanes and sidewalks on both sides of the roadways. Landscape strips would separate the sidewalks from the roadway. A continuous two-way left turn lane would be used in place of a median on Hydraulic Road. Cross section 5B in Figure 5.36 illustrates this condition.
Berkmar Drive
Berkmar Drive from Rio Road to Hilton Heights Road would be a four-lane boulevard with a 16 ft center median with on-street bike lanes and sidewalks on both sides of the roadway. Landscape strips would separate the sidewalks from the roadway. Cross section 7A in Figure 5.36 illustrates this condition. Segments of Berkmar Drive would have on-street parking. Cross section 7B in Figure 5.36 illustrates this condition. There are constrained locations on Berkmar Drive where insufficient width is available for the above conditions. In those cases, the center median would be reduced to a nominal 4 to 6 ft and left turns would be made from the inside through lanes rather than in dedicated left-turn lanes.

As Berkmar Drive extends north from Hilton Heights Road, the west side of the roadway would be modified to provide bays for parking with landscaping in between the parking pockets and would replace the sidewalk and on-street bike lane with a multi-use path that would continue across the bridge over the South Fork of the Rivanna River. Cross section 8 in Figure 5.36 illustrates this condition. North of the bridge, Berkmar would be a rural four-lane boulevard with multi-use trails on either side of the roadway. Cross section 10 in Figure 5.36 illustrates this condition.

Airport Road
Airport Road would continue as a four-lane boulevard without parking, but with on-street bike lanes and sidewalks on both sides. Landscape strips would separate the sidewalks from the roadway. Cross section 18 in Figure 5.36 illustrates this condition.

Two-Lane Roadways

Hillsdale Drive, Berkmar Drive, New Routes in Mixed Use Centers
Hillsdale Drive, portions of Berkmar Drive (south of Rio Road and in Hollymead Towncenter) and several of the new streets in mixed-use centers would be two-lane avenues with center medians, on-street parking and bike lanes and sidewalks with tree wells on both sides. Cross section 3 in Figure 5.35 illustrates this condition.

Towncenter Drive, Ring Roads, Uptown Main Street, Northside Drive, Hollymead Drive
Towncenter Drive and portions of the Ring Roads at Rio Road would be two-lane avenues with on-street parking and sidewalks with tree wells on both sides. Cross section 4A in Figure 5.35 illustrates this condition. The main street in the Uptown would have a similar cross section, but with wider sidewalks (see Cross section 12). Northside Drive and Hollymead Drive extended would have the same traffic zone design, but the sidewalks with tree wells would be replaced on one side by a sidewalk and a landscape strip and on the other by a landscape strip and a multi-use path (see Cross section 14B)

Cedar Hill Drive Extended, Piney Mountain Loop
Cedar Hill Drive north of Greenbrier and the Piney Mountain Loop road would be two-lane avenues with on-street parking and bike lanes on both sides. Cross section 19A in Figure 5.35 illustrates this condition. The portions of Cedar Hill Drive adjacent to existing residential would be modified to have on-street parking and a sidewalk with tree wells on only one side. The sidewalk and parking on the west side would be replaced with a rainwater garden swale that would buffer the existing residential from the new roadway. Cross section 6 in Figure 5.35 illustrates this condition.
Lewis and Clark Drive
Lewis and Clark Drive from Airport Road to Northside Drive would be a two-lane avenue with a center median and on-street parking on both sides. One side would have sidewalks with tree wells and the other would have a landscaped strip and a multi-use path. Cross section 11 in Figure 5.35 illustrates this condition.

North Pointe Boulevard
North Pointe Boulevard would be a two-lane avenue with a center median, bike lanes and sidewalks on both sides. Landscaped strips would separate the sidewalk from the roadway. Cross section 13 in Figure 5.35 illustrates this condition.

Proffit Road
Proffit Road from Worth Crossing to Pritchett would be a two-lane avenue with a center turn lane without parking. One side of the roadway would have a sidewalk and the other a multi-use path, both separated from the roadway by landscape strips. Cross section 14A in Figure 5.35 illustrates this condition. East of Pritchett, Proffit Road would transition to rural drainage and the sidewalk would be discontinued.

Potential Transportation Improvements beyond 2025

Potential Roadway Improvements & Recommendations for Further Study

Eastern Connector
The Eastern Connector concept analysis evaluated three different possible alignments and connecting points for the Eastern Connector as shown in Figure 5.44. Alignment 1 would connect to Rio Road, Alignment 2 would connect to Polo Grounds Road and Alignment 3 would connect to Proffit Road. Alignments 1 and 2 would connect to Stony Point Road (Route 20) that intersects with US 250 east of the Rivanna River. Alternative 3 would connect to Turkey Sag Road (in Gilbert), which connects to Louisa Road that intersects with US 250 further east in Shadwell.

The findings of the Eastern Connector concept analysis are shown in the following tables. Screenline 1 is drawn north-south (see Figure 5.44) just east of US 29, while Screenline 2 is drawn north-south just west of Route 20 (Stony Point Road).

Screenline 1 Volume Comparison (East side of US 29)

<table>
<thead>
<tr>
<th>Roadway</th>
<th>No EC</th>
<th>Alignment 1</th>
<th>Alignment 2</th>
<th>Alignment 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rio Road East</td>
<td>25,900</td>
<td>26,300</td>
<td>25,600</td>
<td>26,000</td>
</tr>
<tr>
<td>Polo Grounds Road</td>
<td>5,100</td>
<td>4,200</td>
<td>6,700</td>
<td>5,900</td>
</tr>
<tr>
<td>Proffit Road</td>
<td>8,200</td>
<td>8,200</td>
<td>8,300</td>
<td>8,400</td>
</tr>
<tr>
<td>Burnley Station Road</td>
<td>7,700</td>
<td>7,300</td>
<td>6,700</td>
<td>7,000</td>
</tr>
</tbody>
</table>

Screenline 2 Volume Comparison (west of Route 20/Stony Point Road)

<table>
<thead>
<tr>
<th>Roadway</th>
<th>No EC</th>
<th>Alignment 1</th>
<th>Alignment 2</th>
<th>Alignment 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>US 250</td>
<td>72,400</td>
<td>61,300</td>
<td>70,800</td>
<td>72,000</td>
</tr>
<tr>
<td>East Connector</td>
<td>-</td>
<td>12,900</td>
<td>4,400</td>
<td>2,800</td>
</tr>
<tr>
<td>Profit Road</td>
<td>8,600</td>
<td>7,600</td>
<td>6,100</td>
<td>7,200</td>
</tr>
<tr>
<td>Total</td>
<td>81,000</td>
<td>81,800</td>
<td>81,300</td>
<td>82,000</td>
</tr>
</tbody>
</table>
Connecting the Eastern Connector to Rio Road is shown to produce the most interaction with the US 29 North Corridor. Linking an Eastern Connector to Rio Road would increase the need for a direct southbound to eastbound ramp at the intersection/interchange of Rio Road and US 29 rather than a ring road as is included in the preferred network. Constructing Northern Free State Road would reduce the need for the direct ramp by intercepting traffic north of the Rivanna River.

Northern Free State Road

The network analyses indicated that if Berkmar Drive is extended across the south fork of the Rivanna River, the Northern Free State Road connection would not be necessary within the 2025 planning horizon. However, the operations analyses showed that by 2025, several locations on US 29 would be near capacity to the extent that additional development in the northern portion of the corridor beyond 2025 would require additional improvements on US 29. In this post-2025 condition, Northern Free State Road would be required to relieve traffic on US 29. An Eastern Connector alignment (see the following discussion) that links to either Rio Road or Polo Grounds Road would reinforce the need for the Northern Free State Road connection across the river. Accordingly, preserving right-of-way for the roadway is included as an element of the plan.

Bicycle/Pedestrian Bridge at Comdial

[Judy: I suggest that all we say here is that the bridge would take advantage of the topography on the western side of the road in a way similar to the bridge at Berkmar/Fashion Square Mall. Could include a reference back to the section that describes this and the photo simulation. – Thomas]

Potential Transit Improvements

The potential for development in the northern portion of the corridor by 2025 indicates the need to expand the transit system into the northern portion of the corridor. The trip length and travel time from Charlottesville into the Hollymead area and to employment in the NGIC and GE Fanuc campuses is sufficiently long that transit will need significant advantages to be successful. Accordingly some higher speed form of service like Bus Rapid Transit (BRT) or Light Rail Transit (LRT) has been considered for the corridor. The pattern of future development will also substantially affect the viability of such transit service. If lower density patterns similar to that currently found in the northern segment of the corridor are continued, it is unlikely that the critical concentrations of potential transit users will be present to support a higher speed type of service.

The potential for transit, bike and walk trips in the corridor were estimated using a series of factors that were applied within the travel forecasting model. The factors are based on findings from comparative surveys conducted in traditional neighborhoods and in conventional suburban neighborhoods. The estimates address trip-making within Centers and between Centers and Neighborhoods as a function of Center size and proximity to transit service, and are calculated on the basis of a comparison of the land use intensity of the Center with that of a typical suburban area. The adjustment factors indicate that about 7,000 trips could occur on transit and that about 9,000 trips could be sufficiently short that they could be accomplished by non-auto modes. In the aggregate, this level of transit use would represent about 2% of the overall travel demand and the non-auto potential would be a similar amount. The combined amounts would reduce the auto trip making by about 5%, which could defer the timing of some of the improvements proposed for the corridor, but would not ultimately preclude the need for the proposed improvements.
5. Future Land Use and Transportation Framework – Appendix of Illustrations

*Suggested Captions are listed below (for actual images, please refer to the attached PDF)*

**NOTES:**

*None*

**Chapter 5 - Figure Captions:**

Figure 5.1a: Framework Map – North

Figure 5.1b: Framework Map – South

Figure 5.2a: Transect Map – North

Figure 5.2b: Transect Map – South

Figure 5.3: Height to width ratios along thoroughfares

Figure 5.4: Concept plan of bike/pedestrian bridge across US29 at Berkmar Dr.

Figure 5.5: Photo Simulation of bike/pedestrian bridge US 29 at Berkmar Dr.

Figure 5.6: Mixed-use neighborhood along Berkmar Dr. near US 29 - Existing conditions

Figure 5.7: Mixed-use neighborhood along Berkmar Dr. near US 29 – Photo Simulation of initial redevelopment

Figure 5.8: Mixed-use neighborhood along Berkmar Dr. near US 29 – Photo Simulation of possible complete redevelopment

Figure 5.9: Corner of Uptown located in UVA Research Park at Lewis & Clark/Airport Rd. intersection - Existing conditions

Figure 5.10: Corner of Uptown located in UVA Research Park at Lewis & Clark/Airport Rd. intersection – Photo Simulation of initial phase of development w/ surface parking lot

Figure 5.11: Corner of Uptown located in UVA Research Park at Lewis & Clark/Airport Rd. intersection – Photo Simulation of possible complete development with mixed-use corner building

Figure 5.12: Overview of potential opportunity sites

Figure 5.13: Berkmar Dr. at Sam’s Club - Existing conditions

Figure 5.14: Berkmar Dr. at Sam’s Club - Photo Simulation of Berkmar Dr. w/ realigned parking lot

Figure 5.15: Berkmar Dr. at Sam’s Club – Photo Simulation of potential complete redevelopment w/ Neighborhood Service Center without trees
Figure 5.16: Berkmar Dr. at Sam’s Club – Photo Simulation of potential complete redevelopment w/ Neighborhood Service Center with street trees

Figure 5.17: Concept plan of potential redevelopment of Sam’s Club area - Existing conditions

Figure 5.18: Concept plan of potential redevelopment of Sam’s Club area - Potential initial phase of redevelopment

Figure 5.19: Concept plan of potential redevelopment of Sam’s Club area - Potential second phase of redevelopment

Figure 5.20: Concept plan of potential redevelopment of Sam’s Club area - Potential final phase of redevelopment

Figure 5.21: Potential redevelopment of Albemarle Square - Existing conditions

Figure 5.22: Potential redevelopment of Albemarle Square – Photo Simulation of potential initial phase of redevelopment with new mixed-use buildings

Figure 5.23: Potential redevelopment of Albemarle Square – Photo Simulation of potential interim stage of redevelopment

Figure 5.24: Potential redevelopment of Albemarle Square – Photo Simulation of potential complete redevelopment with Public Green and pedestrian-oriented streets

Figure 5.25: Concept Plan of potential redevelopment of Albemarle Square area - Existing Conditions

Figure 5.26: Concept plan of potential redevelopment of Albemarle Square area - Potential initial phase of redevelopment

Figure 5.27: Concept plan of potential redevelopment of Albemarle Square area - Potential intermediate phase of redevelopment

Figure 5.28: Concept plan of potential redevelopment of Albemarle Square area - Potential final phase of redevelopment

Figure 5.29A: Green Infrastructure Map North

Figure 5.29B: Green Infrastructure Map South

Figure 5.30: Alternatives 2025 Daily Traffic Volumes

Figure 5.31: 2025 Daily Traffic Volumes at Polo Grounds Road Screenline (image embedded in the text)

Figure 5.32: Transportation Network Diagram

Figure 5.33: Transit Improvements

Figure 5.34: US 29 Cross Sections
Figure 5.35: Two-lane Roadways Example Cross Sections

Figure 5.36: Four-lane Roadways Example Cross Sections

Figure 5.37: Example of Multi-Use Paths along east side of US 29

Figure 5.38: Photo simulation of proposed Bike/Pedestrian Overpass at Berkmar Drive and US 29

Figure 5.39: Diagram of pedestrian and bicycle circulation as part of grade-separated crossing (example shows single point urban interchange proposed at US 29 and Hydraulic Road)

Figure 5.40: Example of well-designed Pedestrian Underpass

Figure 5.41: Photo simulation of at-grade crossing with enhanced pedestrian refuges between turn and travel lanes at US 29 and Albemarle Square (looking south)

Figure 5.42: The three design zones of a cross section (image embedded in the text)

Figure 5.43: Transportation Network and Proposed Cross Sections

Figure 5.44: Eastern Connector Alternatives