3. INTERCONNECTED STREETS AND TRANSPORTATION NETWORKS

There are a number of different approaches to interconnect streets in neighborhoods and Development Areas. Interconnections provide different routes for automobile traffic, which helps to better distribute neighborhood traffic and to provide alternate access for emergency vehicles. Other transportation options help to reduce reliance on the automobile.

The first set of options, “Interconnected Streets,” shows “grid” streets in their “pure” form. The different options are not mutually exclusive, though, and can be combined. The list of permutations is infinite and the road design in each neighborhood must be carefully considered to find the pattern or patterns that work best with existing development, density desired by the County, and terrain.

The second subsection describes “Other Transportation Networks.” These options encourage travel by means other than the automobile.

INTERCONNECTED STREETS

The Rectilinear Grid Pattern

**Definition:** The rectilinear grid pattern is a street system providing maximum road connections and some road hierarchy. It represents the classic grid street pattern used in many street systems laid out at the turn of the century. This pattern is the preferred pattern in the absence of natural features to prevent its use.

**Characteristics:**
- Provides opportunities for the creation of blocks.
- It allows for and promotes a variety of lot types within an easily managed menu of options.
- A hierarchy of thoroughfares can provide opportunities for architectural treatment of buildings at corners.
- Alleys can be loaded on both sides, providing efficiency in infrastructure.
- Some streets may terminate at T-intersections, especially in General Areas and Edges.
- It may have park spaces interspersed at regular intervals or more randomly.
- Straight thoroughfares can enhance the character of rolling terrain.
- The pattern is easily expandable.
- Unless it is interrupted periodically, it can be monotonous, such as exists in Manhattan.
- It does not work well on steeply sloping terrain in cold climates.
- It must be seriously deformed to accommodate environmental features such as ravines.
The Diamond Grid Pattern

Definition: The diamond grid pattern is a grid street system characterized by interconnections at angles.

Characteristics:
- It can work well with steep grades; at extreme grades, a discontinuous pattern may be justified.
- A variety of lot sizes are possible.
- It can produce spectacular and dramatic “hill towns.”
- It can result in awkward intersections that are not in conformity with VDOT standards; intersection safety must be considered.
- Alleys may be difficult to accommodate.
- Some lots may be awkward in shape and in terrain, making building difficult and expensive.
- Siting of buildings relative to streets can be difficult. Effort must be made to avoid the look of houses seeming to sit high above the street or houses falling down a hill.

The Picturesque Landscape (Olmstedian) Pattern

Definition: Inspired by American landscape architect Frederick Law Olmsted’s plan for Riverside, Illinois, the Picturesque Landscape pattern is a loose and warped grid able to respond easily to terrain and natural conditions.

Characteristics:
- It works well with steep grades and is highly responsive to terrain by absorbing environmental features.
- The monotony of the grid is broken by deflected vistas.
- It provides for even dispersal of traffic throughout the network.
- Blocks are not easily created which makes it appropriate only for single-family detached houses.
- It can be very disorienting to motorists, making it easy for them to get lost.
- There is no hierarchy of streets intrinsic to the concept.
- Lot sizes cannot be controlled.
- When used too often, this pattern can become monotonous.
The Rural Village Pattern

Definition: The Rural Village pattern is a loose network of streets that resembles a slightly twisted and discontinuous grid street pattern with varying block sizes.

Characteristics:
- It provides a series of interconnections that are loosely organized rather than systematic.
- T-intersections are commonplace, as are intersections at 85 degree angles.
- Sidewalks serve as pedestrian paths.
- It follows existing roads on the land which normally result from natural features.
- It easily responds to environmental features such as swales, streams and slopes by avoiding them.
- Monotony is eliminated by deflected and terminated vistas.
- A street hierarchy provides opportunities for higher design speeds and long routes for through traffic.
- The street network provides for even dispersal of traffic.
- Building lots sometimes are larger than is appropriate.
- Blocks are difficult to design.
- It may provide too many intersections or intersections at angles too acute for VDOT standards.
- It can be difficult to expand because it can avoid existing development.

The Curvilinear Grid Pattern

Definition: The curvilinear grid pattern is a modified grid that provides fewer connections than the Rectilinear and Diamond Grid and more easily adapts to the terrain.

- It can be used with new and existing development patterns.
- Thoroughfares are curved and run parallel to the topography to accommodate moderately sloped terrain.
- A variety of lots can be accommodated and designed.
- A hierarchy of thoroughfares can provide for architectural treatments on corners for higher design speeds.
- Alleys are loaded on both sides, providing efficiency in infrastructure.
- Curving streets can provide another way to create visual interest.
- Paths (with stairways and ramps) may be included mid-block where grades prevent vehicular access.
- The system is easily expandable.
- Curvilinear blocks can be challenging to the creation of lots for townhouses and are more difficult to plat.
- It may reduce the character of sloping terrain by paralleling it.
- It can result in asymmetrical streets with uphill and downhill houses with retaining walls.
The Spiderweb or Star Pattern

**Definition:** The Spiderweb Pattern is a grid pattern of streets radiating from a center and interconnected mostly at right angles. It is a geometrically pure pattern with a central focus and derives from the Italian Renaissance notion of the Ideal City.

**Characteristics:**
- It creates formalized central space.
- Diagonal streets can create hierarchy for through traffic.
- Streets may be positioned to respond to ridges and swales of terrain.
- Traffic is dispersed evenly through the network.
- The monotony of the grid can be interrupted by deflected vistas.
- The street system can be disorienting and difficult for drivers to use.
- It requires many special buildings, particularly at the center, in order to achieve spatial definition.

The Stem Pattern

**Definition:** The stem pattern is characterized by a series of cul-de-sac streets feeding onto collector streets and arterials. It is the pattern that characterizes much of the conventional development in Albemarle County. This pattern is not recommended for standard application in the Development Areas. It may be appropriate in unique situations.

**Characteristics:**
- It is a completely hierarchical system and conforms to the existing VDOT hierarchy of streets, terminology, and standards.
- It can be responsive to steep terrain.
- It can provide for a maximum number of lots on discontinuous streets.
- Where it was perfected in Radburn, New Jersey, it offered a secondary system of pedestrian paths behind each stem of houses to separate pedestrian from vehicular traffic.
- It can contribute to traffic congestion by the absence of an interconnected network.
- Longer average vehicles miles traveled result from backtracking.
- A complete separation of land uses and housing types is intrinsic to the pattern.
- The street hierarchy results in major collector roads lined with rear-facing lots, usually as separate entry drives.
- Separate pedestrian paths are rarely provided because of the assumption that residents can walk in the street for recreation.
- High design speeds and wide roadways can lead to excessive speed.
OTHER TRANSPORTATION NETWORKS

Bikeways

Definition: A bike way is part of a safe, convenient, well marked and easily understood network that may include both on- and off-road routes.

Features:
- A bike lane is a marked lane of a roadway for the exclusive use of cyclists.
- A bike path is an off-road asphalt path used for both recreation and travel.
- A bike route is a signed or unsigned area of any low-volume thoroughfare where cyclists feel comfortable sharing the roadway with automobiles.
- The local thoroughfare network should supply the vast majority of low-volume, low-speed routes for cyclists directly on the pavement, allowing cycling to daily activities.
- In the rare instances where abutting cul-de-sacs are developed they should have a cycle-path connection. A continuous local street system parallel to arterial streets is a preferred option for cyclists rather than providing cycle lanes or separate paths on arterial roads.
- On thoroughfares with projected traffic volumes of more than 3,000 vehicle trips per day (serving over 300 residences) and near schools where long-distance commuter and recreational cycling are undertaken, lanes should be marked specifically for bicycles.
Bus Routes, Vans, and Light Rail

Bus Routes

**Definition**: A bus route is a travel path for regularly scheduled multi-passenger vehicles. Operating generally on existing roads, routes are readily identifiable by being well marked with convenient stops and frequent service. Buses may operate regionally approximating Light Rail when using dedicated lanes within the highway system. Bus routes are relatively inexpensive systems that may be phased in small increments.

**Features**:
- Bus route designs should be considered during the making of the Development Area Master Plans. Bus routes can be designed to link neighborhood centers together as well as to provide linkage to Core areas, employment centers, and future light rail stops.
- Bus routes should be located on boulevards, avenues, rural boulevards, and commercial streets.
- Thoroughfares designed with bus routes should have appropriate widths and turning radii.
- Bus stops should be located at convenient intervals to balance accessibility with running time.
- Bus stops should be located at potential destinations including schools, neighborhood Centers, future light rail stations, the Airport, recreational areas, major retail areas, and employment centers.
- Bus stops should have visual surveillance from surrounding areas. Where possible, they should provide a place to sit, shade, and shelter from the rain and snow. Waiting for a bus should be a comfortable activity.

Van or Jitney Service

**Definition**: A van or jitney is a small multi-passenger vehicle running on shared lanes within the general thoroughfare system.

**Features**:
- Vans and jitateys travel at low speeds.
- They follow a short looped route and can be made available for door-to-door service through telephone requests.
- They can provide a feeder system to other types of mass transit.
- Vans and jitateys are the least expensive transit option and they can be phased in small increments prior to providing a full bus route.
- They can travel on virtually all streets because of their small size.
Light Rail

**Definition:** Light rail includes multi-passenger vehicles that run on tracks, sometimes within the vehicular thoroughfare system and sometimes within a railroad right-of-way. Light rail cars are designed for both low and medium speeds and can have half-mile (neighborhood) intervals within an urban fabric and stops at two-mile intervals in rural areas. The term “light rail” also includes trolleys and street cars.

- Light rail design should be considered during the making of a Development Area Master Plan. Even if current densities do not support light rail, providing space in boulevard medians and other rights-of-way will not preclude provision of light rail in the future. Centers and Employment Districts can be destinations for light rail service.

*Figure 6.32 Example of frequency of stops - Light Rail System vs. Bus System.*