BACKGROUND

One of the consistent themes heard from localities in the Route 29 corridor Planning Forums was the need for expanding rail service in the corridor. This was repeatedly brought up as an idea whether in the urbanizing segments close to Northern Virginia or in more small town and rural areas on the corridor. While enhancing rail service is only one aspect of a broad-based strategy that is needed to address the current and future conditions on the corridor, it is nevertheless a strategy that can bring considerable benefit over the long term. Some of the points brought up by citizens and local officials regarding enhanced rail service include:

- Helping to mitigate corridor congestion by converting some passenger or freight trips from road to rail
- Increasing travel options and accessibility along the and near the road corridor
- Providing potential economic revitalization stimulus in and around existing or future station areas, as well as providing regional economic benefits through greater mobility for jobs and tourism.

Upgrading rail service over the long term – whether freight, commuter or intercity passenger rail on and around the Route 29 corridor - is a key focus of this corridor plan and its recommendations. The following working paper addresses some of the land use and community development aspects associated with the enhancement and/or expansion of rail service in the Route 29 corridor.

BENEFITS OF TRANSIT ORIENTED AND TRANSIT SUPPORTIVE DEVELOPMENT

The benefits of land use and development patterns generally known under the designation of Transit Oriented Development (TOD) are both extensively researched and documented in the technical literature. Among benefits cited for transit oriented development are the following[1] :

Providing greater mobility choices
By creating "activity nodes" linked by transit, TOD can provide important mobility options, for all citizens. It ca also allow young people, the elderly, people who prefer not to drive, and those who don't own cars more ability and options to get around.

Increasing public safety
By creating active places that are busy through the day and evening and providing "eyes on the street", TOD helps increase safety for pedestrians, transit-users, and many others

Increase transit ridership
TOD improves the efficiency and effectiveness of transit service investments by increasing the use of transit near stations by 20 to 40 percent

Reduce rates of vehicle miles traveled (VMT)
TOD can lower annual household rates of driving by 20 to 40% for those living, working, and/or shopping near transit stations.

Increase households' disposable income
Housing and transportation are the first and second largest household expenses, respectively. TOD can free-up disposable income by reducing driving costs; saving $3-4,000 per year for each household.

Reduce air pollution and energy consumption rates
By providing safe and easy pedestrian access to transit, TOD can lower rates of air pollution and energy consumption. Also, TODs can reduce rates of greenhouse gas emissions by 2.5 to 3.7 tons per year for each household.

Help conserve resource lands and open space
Because TOD consumes less land than low-density, auto-oriented growth, it reduces the need to convert farmland and open spaces to development.

Play a role in economic development
TOD is increasingly used as a tool to help revitalize aging downtowns and declining urban neighborhoods, and to enhance tax revenues for local jurisdictions.

Decrease infrastructure costs
Depending on local circumstances, TOD can help reduce overall infrastructure costs for expanding water, sewage and roads to local governments by up to 25% through more compact and infill development.

Contribute to more affordable housing
TOD can add to the supply of affordable housing by providing lower-cost and accessible housing, and by reducing household transportation expenditures. Housing costs for land and structures can be significantly reduced through more compact growth patterns.

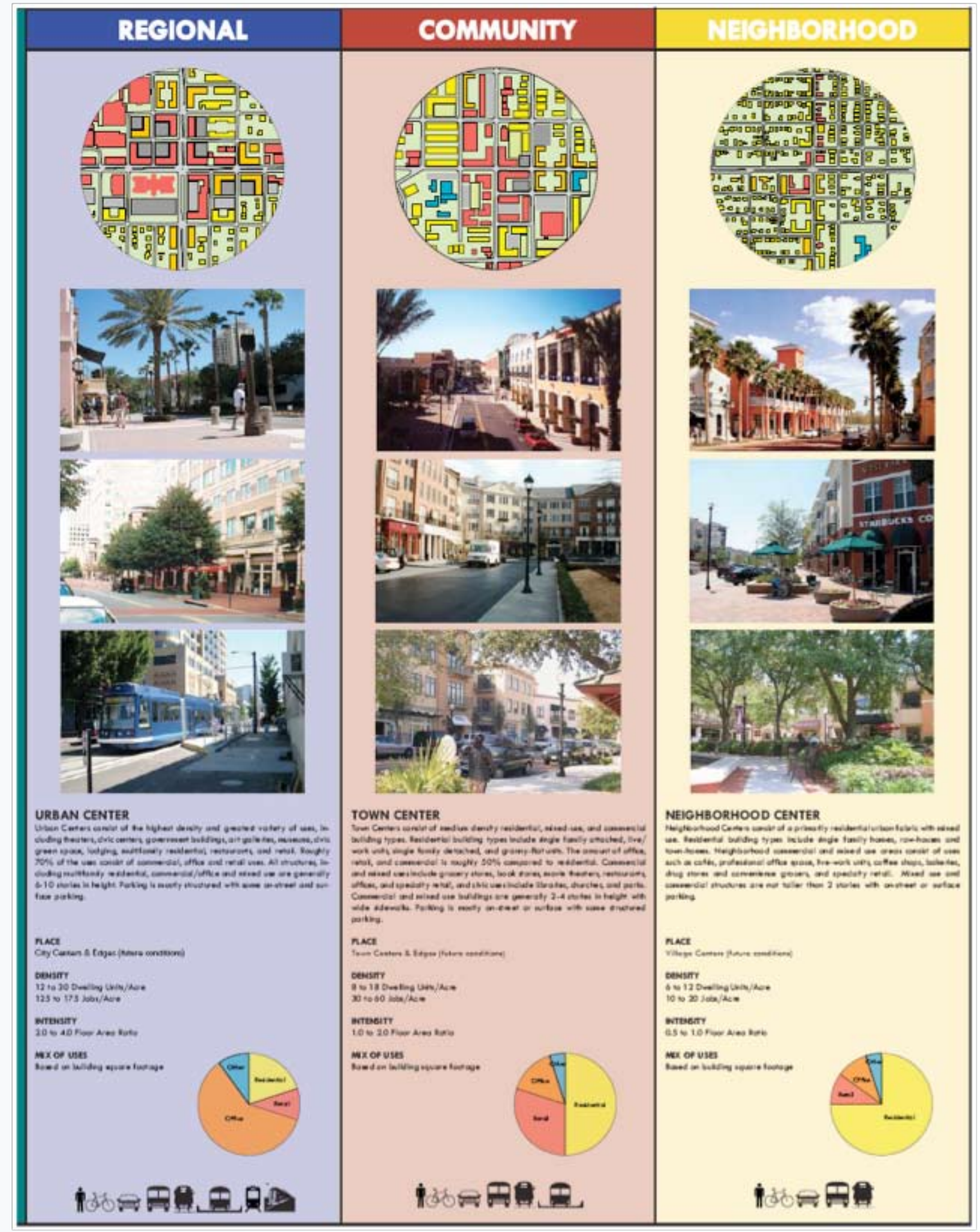
RAIL CORRIDOR COMMUNITY PLANNING PRINCIPLES

To design and implement new and enhanced rail service in the Route 29 corridor, this study is recommending a variety of enhancements and improvements over time. The following Rail Corridor Community Planning Principles are part of these recommendations. The Rail Corridor Community Planning Principles provide land development principles and standards for rail-oriented design for communities in the rail transit and intercity rail corridor.

The Planning Principles are organized first into a series of "Mobility Elements" that define the typical travel-shed and spacing parameters by mode. Secondly, the principles are organized into "Station Area Characteristics." These define the desired characteristics such as densities, intensities and mix of uses for 3 different scales of future transit/rail centers. For each of these scales, a complementary set of transit station area prototypes were developed using the Mobility Elements. Regional, community and neighborhood scale station area prototypes were used to represent the station area's corresponding land use mix, percent infill and redevelopment, site development characteristics, population, employment, and density. The station area intensity and land use varies by station area based on its location along the corridor, the neighborhood context, and transit technology applied. As transit is most effective in walkable areas, the highest densities and mix of uses apply to the transit core areas (one half and one quarter mile).

1 Adapted from the *Statewide Transit-Oriented Development Study* by CalTrans, 2006


PEDESTRIAN
BICYCLE
AUTO
BUS
CIRCULATOR
BUS RAPID
LIGHT RAIL
COMMUTER RAIL


REGIONAL
COMMUNITY
NEIGHBORHOOD
URBAN CENTER
TOWN CENTER
NEIGHBORHOOD CENTER

DETAILED PLANNING PRINCIPLES

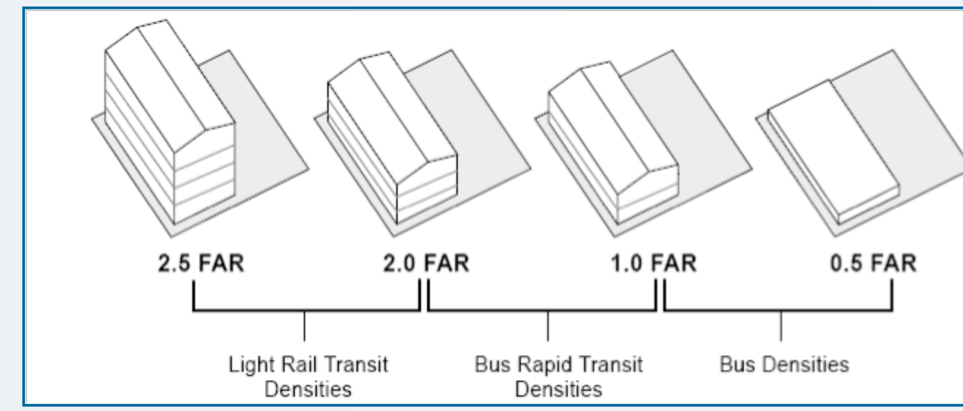
Following are some basic planning principles for making enhanced rail service in the 29 corridor a good fit with existing and planned communities. In general, these principles apply for communities around rail stations in general – whether they are transit stations within the Northern Virginia commute-shed or whether they are small towns or cities that are intra-city rail stops outside the commute-shed. The main difference lies in the degree of spin-off benefits and impacts of different types of rail service. For example, a transit station with 10 or 12 trains per day in the commute shed could be expected to stimulate much more directly transit-dependent development within a short walk of the station area than a small town with only one or two intra-city trains per day. However, the same basic principles apply in both contexts, including leveraging the activity around the station area to create a vibrant and appealing walkable environment. In the principles below, the term Transit Oriented Development and TOD are used almost exclusively, but the term is intended to apply more broadly in the Route 29 corridor, since the same basic principles also apply to intercity rail station areas in communities along the corridor.

Compact Development & Mixed Use

Transit-oriented design improves mobility and leverages public investment in transit systems by using pedestrian and transit-friendly development patterns. These development patterns encourage a compatible mix of residential, commercial, and other land uses, facilitate employment opportunities convenient to transit, and enhance connectivity to transit stations and surrounding uses. Transit stops should be centrally located within compact, walkable areas to ensure convenient access for pedestrians. A one quarter-mile radius area, or the distance that a pedestrian can comfortably travel in five minutes, is referred to as the pedestrian shed. Transit ridership is directly influenced by the density and diversity of uses within the pedestrian shed. High density, mixed-use development maximizes ridership potential by locating offices, retail and commercial uses, and residences within walking distance to transit.

Density and Transit

Most people will choose to walk if a destination is within a quarter of a mile and will not walk if the destination is more than a half-mile away. Because of the importance of walk access to transit ridership, this influence of distance on whether or not to walk defines the market area around a transit station. The primary market area is within a quarter mile and the secondary area within a half mile of the station. Because the station market area is fixed (roughly 500 acres), density directly influences the number of person trips generated and potential transit ridership. Higher capacity transit systems, such as light rail transit, require higher densities to generate enough ridership to help pay the higher costs. Density is expressed in terms of floor area ratio (FAR), which is the total building area divided by the total lot area. Bus transit is supported with FARs of at least 0.5 and preferably over 1.0. Light rail transit is supported with FARs of 2.0 or greater.



Pedestrian Accessibility

Transit oriented site design creates enjoyable places that make walking an attractive mode of transportation. Transit stops should be accessible to pedestrians, located at the core of compact development and surrounded by a good mix of land uses. Typically, the attractiveness of transit and rail use is enhanced by the presence of supportive uses that generate pedestrian activity, such as convenience stores, small shopfronts and cafes. In general, sidewalks of at least 8-12 feet width should be provided within the ¼ to ½ mile pedestrian shed around station areas to ensure good walkability and allowance for street trees, benches, and other street furniture and amenities that contribute to making this area attractive to pedestrians.

Pedestrian crossings are a critical element of the pedestrian network. Safe and convenient crosswalks make a sidewalk system usable and appealing, encouraging pedestrian activity. Crosswalks should be clearly marked and located carefully in relation to vehicular traffic. To ensure safety and usability, crossing distances should not exceed 50' whenever possible. Bulb-outs and median refuge islands should be used to reduce crossing distances for pedestrians. Marked crosswalks that are specially paved or painted indicate the appropriate route across traffic for pedestrians, assist the visually-impaired, and encourage motorists' awareness of pedestrians. Crosswalks should be aligned with the path of the sidewalk to ensure accessibility. Intersections and crossing areas with heavy traffic or wide crossing distances require crossing signals to aid pedestrians and motorists.

Station Area Design

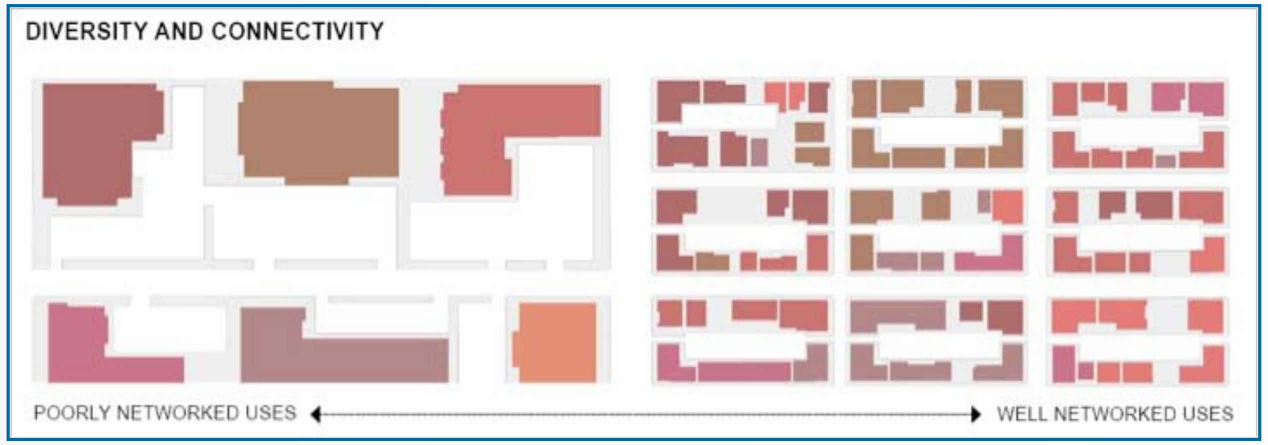
Transit must have an attractive and cohesive image to be considered as an attractive transportation alternative. Well designed shelters and station areas should be integrated into the surrounding community streetscape and provide a safe and comfortable place for transit patrons. Stations and shelters must be clearly marked and identifiable. Bus bays adjacent to station areas should be implemented to allow passengers to load and unload safely by creating a bus-only zone undisturbed by roadway traffic.

Transit stops must, by definition, be accessed by wheelchair or on foot. Therefore, the minimum standards for transit stops should include sidewalk connectivity, posted route information and benches for waiting passengers, and concrete loading pads for boarding transit vehicles. Higher-volume stops should have additional amenities such as shelters, trash cans, newspaper boxes, bicycle racks, and electronic kiosks to display arrival times and other information.

Compatible Street Networks

Streets and corridors provide the framework for Transit Oriented Development. Effective street design is critical to the success of a mixed-use activity center. Streets must provide an efficient and interconnected network for vehicles, bicycles, and pedestrians. Street function and appearance must be in balance with the built environment and create a pleasant and safe experience for travelers and residents with homes and/or businesses facing the street. To ensure a lively street setting, street networks must avoid concentrating travel on a few large roads. A more diverse roadway fabric provides multiple routes of access and evenly distributes activity to create a more energized urban environment. The dispersal of vehicle loads allows streets to be narrower and treated at a human scale.

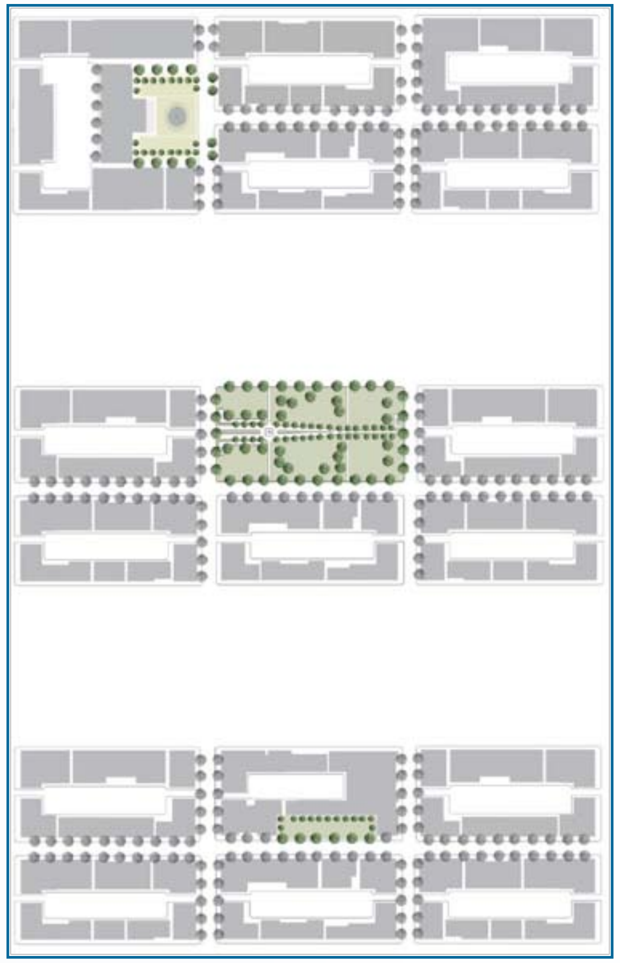
Streetscape elements provide a softened appearance and enhance the quality and appeal for pedestrians. On-street parking and street trees help define a comfortable pedestrian realm buffered from vehicular traffic. Narrow road widths naturally reduce travel speeds and give greater spatial enclosure to the street environment. Enclosure allows the streetscape to be experienced as an 'urban room,' a space that attracts pedestrians and jumpstarts activity



Civic Plazas And Open Space

Carefully planned open space is necessary for the richness of mixed use centers and the vitality of the public realm. Open space is a broad classification for public spaces, ranging from community recreational areas to civic squares. The scale, enclosure, and density of surrounding conditions determine the appropriate type of open space, such as formal/informal, active/passive, or open/contained. Formal civic spaces should be located in the center area, serving the area of highest intensity. Recreational facilities, greenways, and neighborhood parks should be strategically placed to serve the mixed-use communities surrounding the core.

Many qualities contribute to the appeal of open spaces. Often, environmental and natural features are integrated into open space planning. Wetlands, critical slopes, drainage swales, and vegetation should be conserved as open public space wherever possible. In urban settings, water retention systems can be rethought and formalized as landscape elements that punctuate design. Canals, ponds, fountains, and other attractive civic



spaces in the center, promote gathering, interaction, and comfort. Moveable seating, tables, and multi-functional elements, such as planters that are at seat height, allow people to congregate and personally define spaces. Shade trees, greens, and cooling fountains help create a comfortable setting.

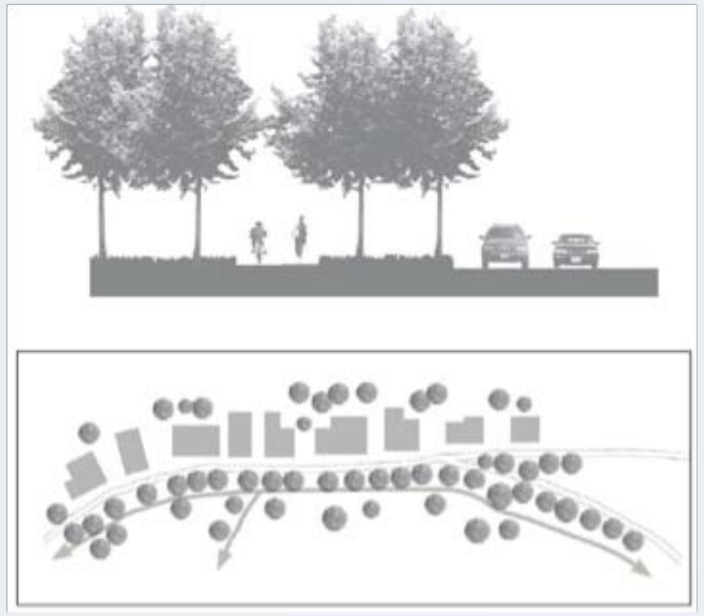
Lighting

Lighting should be carefully integrated with the built landscape. Building, streetscape, and high-speed roadway lighting have unique purposes and requirements. Scale, intensity, and fixture design should vary between areas of different densities and uses. Fixtures should contribute to the streetscape, fostering pedestrian activity and walkability. Ornamental light posts and fixtures help to create an attractive streetscape and should be consistent with the architectural character of the immediate area. In addition to aesthetics and scale, lighting is an important element of public safety. Well lit streets and alleys help to promote a secure environment and encourage night time activity.

Landscaping

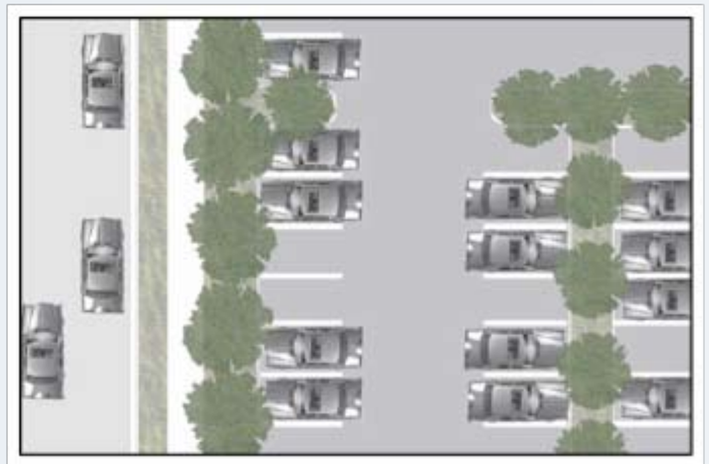
Landscape design should aesthetically complement and enhance the character of buildings, roads, and the pedestrian streetscape. By drawing natural elements into the built environment, buffers harsh elements to maintain pedestrian-friendly and visually appealing streets. Different landscape strategies depend on building scale, density, thoroughfare type, and land use. Trees and plantings also have important environmental benefits, protecting air quality and water run-off and providing shading to buildings, cars, and pedestrians. Bricks and decorative paving may be used to highlight important public spaces and signal significant roadway elements such as bus stops and crosswalks.

An essential element of a vibrant attractive streetscape is landscaping. Landscape treatments buffer vehicular traffic from pedestrian movement, while providing a visually appealing and physically comfortable environment. Planting strips and trees help to distance paved sidewalks from the street, visually screen passing vehicles, and make the sidewalk a more intimate space. Street trees can help to create walkable streets in both high-density centers and residential neighborhoods. Landscape buffers may also screen parking lots and conceal building equipment. Landscape elements can also be used to integrate roadways with the surrounding area. Tree and planting screens protect adjacent buildings, properties, and open land from high-speed traffic. Roadway landscape treatments help ease the transition between center and edge conditions, with landscaping taking a more formal appearance at gateway locations. Medians, which break down large road widths, also contribute to this transition.



Parking

The proper supply, placement and design of parking is a key element in creating an environment conducive to pedestrians, bicyclists, transit users, and those traveling by car. Conventional parking requirements can sometimes lead to an oversupply of parking spaces and open expanses of asphalt. Better management and design strategies can help integrate parking into



TYPICAL PARKING LOT BUFFER

higher-density areas and reduce the demand for parking spaces.
Reducing minimum off-street parking requirements and setting average- usage standards instead of peak-usage standards make additional land available for development. Allowing developers to count on-street parking towards their requirement helps alleviate off-street parking needs. Shared parking allows activities and functions with different peak hours to use the same spaces, significantly cutting down the total number of spaces.

Structured parking may be appropriate in higher-density areas such as those around rail stations.

Garages reduce the total amount of paved area and can fit well into an urban area, maintaining scale and facade articulation. Wrapping structured parking around the perimeter with "liner" buildings allows a seamless integration into the urban setting and maximizes the property's revenue potential. Large lots with surface parking should relate to the established block size of the surrounding street grid. These considerations prepare the site for future infill development, in which surface parking areas are converted into a mix of buildings, garages and streets. Incentives often are needed to offset the high construction cost of parking garages.

Planning For Adaptive Reuse

Many areas along the corridor are characterized by low intensity retail development that is characterized by wide, uninterrupted expanses of asphalt. Parking design and site layout often limit the opportunity for future development and increased density. In contrast, well planned parking strategies can prepare a site for future growth. Arranging surface parking in accordance with standard block size and orientation allows the site to be developed gradually, lot by lot and block by block. Selective aisles should be designed consistent with standard right-of-way dimensions, creating a framework for future road development. By planning for future streets and blocks, parking lots can be gradually integrated with the surrounding urban fabric. Piece by piece, paved open lots may be transformed into higher-density centers.

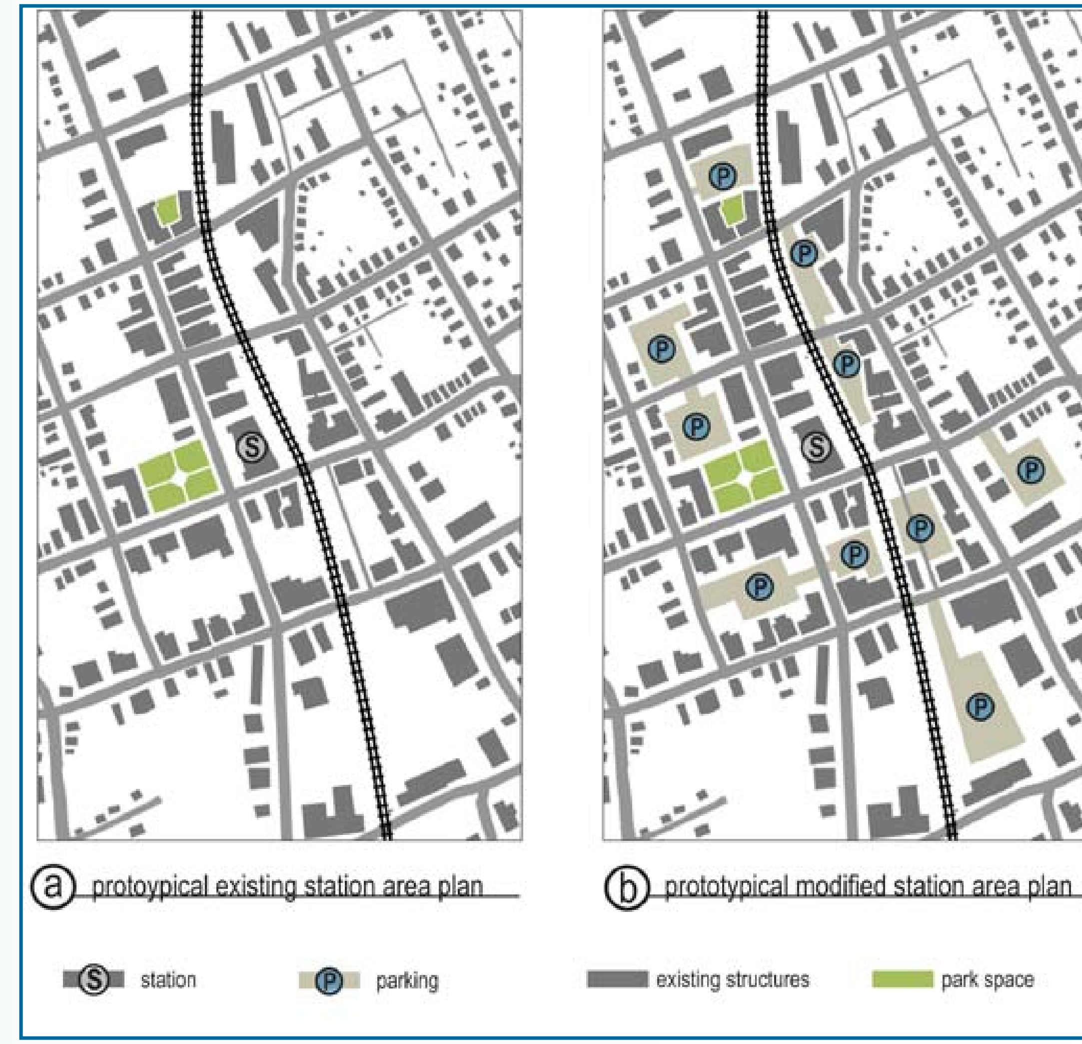
PUTTING IT INTO PRACTICE – PLANNING FOR RAIL SERVICE IN A COMMUNITY

The above sections described a series of principles for efficient land use and community development around rail station areas and transit stops. How does this relate to planning for a typical community? The series of illustrations below describe how these planning principles could be translated into actual practice through a hypothetical plan for accommodating enhanced rail service in a typical small town along the US 29 corridor.

Compatible Development and Redevelopment

The illustrations below show the gradual evolution of transit and rail station-oriented development in a typical small community near the US 29 corridor. While not a specific place, it illustrates typical existing conditions in locations such as Remington, Orange, Nokesville and other small communities that – while they may or may not be directly on the 29 corridor – could nevertheless be affected by increased rail service over time as rail travel options are enhanced. Characteristics of these small communities usually include a compact historic core, surrounded by traditional residential neighborhoods – both of which may be sensitive to the impacts of new development and higher density redevelopment resulting over the years from increased rail service. They also typically are poorly positioned to address the increased parking demand put on the station areas – particularly for communities within the commute-shed.

The illustrations below show how the traditional urban fabric of a historic community could be maintained in the face of new growth by planning for compatible small-scale infill development and off-street parking so that the basic form and scale of the downtown is maintained over time.

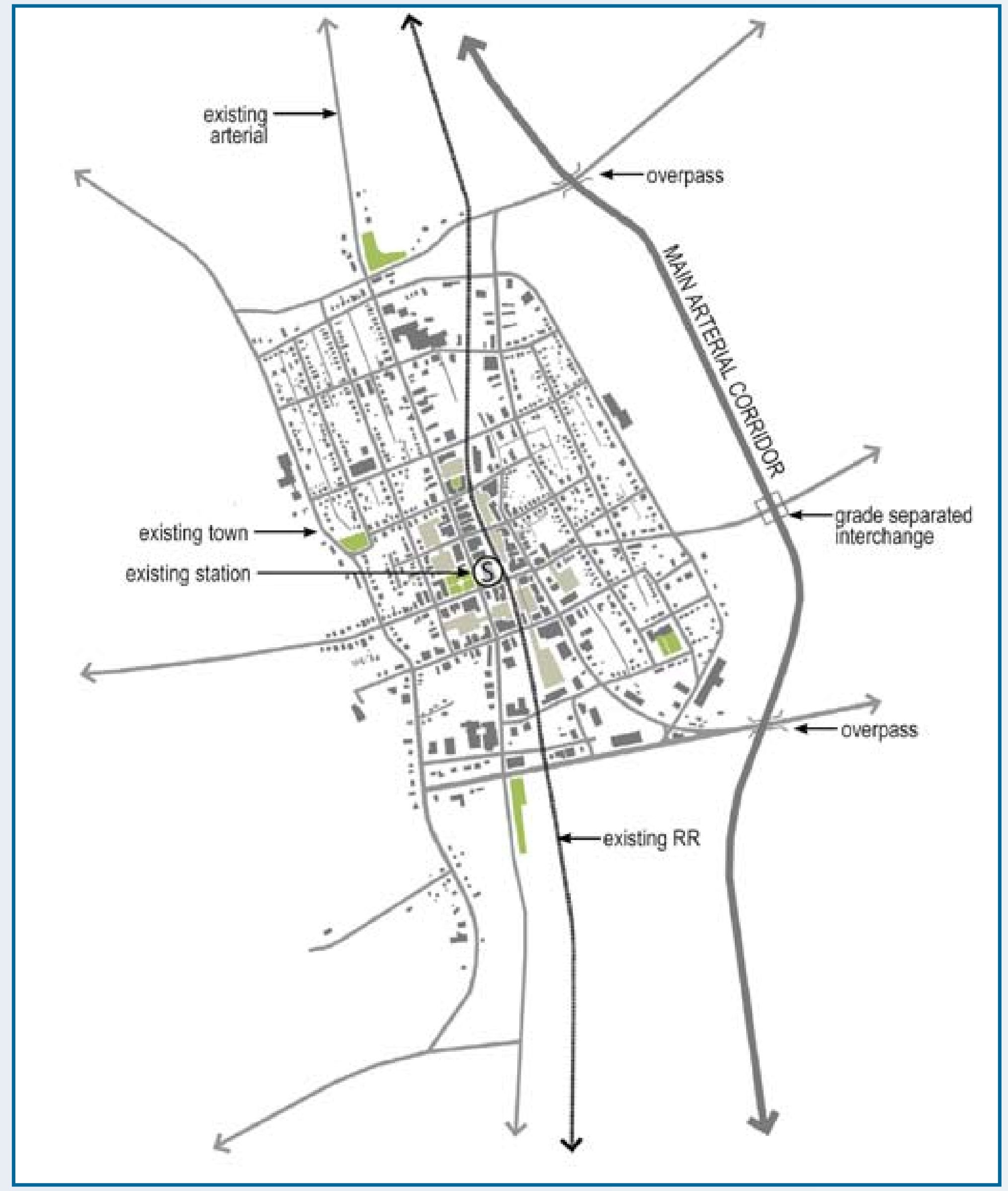


Mixed Uses and Densities

The illustrations below demonstrate a key principle in rail and transit-supportive land uses. As shown in the before and after views below, it is important that new infill development maintain a diverse mix of uses in order to create a more lively round-the-clock range of activities and attractions in the area around the station. In particular, higher density housing is a cornerstone of transit-oriented development. Higher density housing – whether garden apartments, condominiums or urban townhouse development is vital to getting a critical mass of population in the downtown area that will support retail, civic and entertainment uses.

A SUPPORTIVE MULTI-MODAL TRANSPORTATION NETWORK FOR RAIL

It is important to recognize that rail service and transit are critically dependent on other modes for their success. While pedestrian and bike accessibility, especially in and around station areas, has already been mentioned above, one of the most critical factors in the success of transit and rail stations is the accompanying roadway network to get cars and buses efficiently to the station areas. The illustration below shows the same prototypical community as described above in a wider context – including the surrounding roadway network. It illustrates several



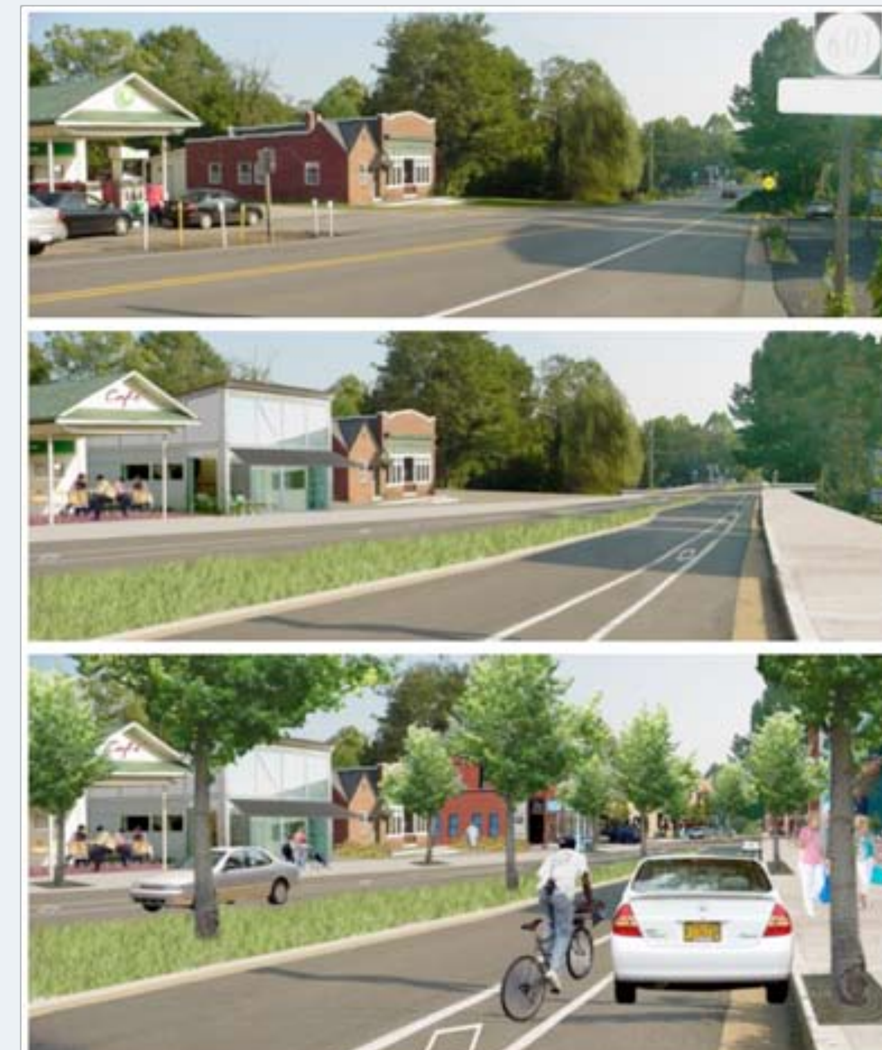
principles of compatible roadway network planning for rail and transit service, including the following:

Connected Network of Secondary Roads

A grid of connected secondary streets will not only facilitate easy vehicular access to station areas, it will support bike and pedestrian access as well. Generally, block perimeters should be less than 1,600 ft (sum of all 4 sides) in order to facilitate a walkable street system.

Appropriate Scale of Development on Arterial Corridors Near Station Areas

The plan below also shows that – as an arterial roadway goes through the walkable core of the downtown – it conforms to the compact development pattern of the town, with higher density buildings close to the road and small blocks with multiple intersections. This will effectively "calm" the traffic



Villages provide a unique opporutnity for infill development. Respecting the character of the existing fabric, new buildings may be integrated to enhance the density of a particular area. This process is not an immediate one, and instead takes place over time, beginning with pedestrian improvements and gradually leading to infill buildings.

on the arterial through the downtown, resulting in a safer environment for bikes, pedestrians and buses and ensuring a more inviting station area context.

Connections to Regional Throughways

The illustration also shows an appropriate design for a high-speed vehicular throughway adjacent to the historic town and rail corridor. Through traffic has been diverted from the original arterial in the heart of the downtown to a new throughway well outside the historic core. However, in order to avoid the unfortunate pattern of "bypass development" drawing economic vitality out of the historic core, the throughway has been designed without direct at-grade connections anywhere near the historic core. A single grade-separated interchange has been shown that can be carefully planned and zoned for compatibly designed auto-oriented development, or – if no additional development is desired – can alternately be zoned for open space preservation.

CONCLUSION

The bottom line for community planning and development around rail stations and transit is compatibility. With the right mix of uses, transportation networks and design features, enhanced rail service can be used by communities to leverage their desired quality of life, as well as greater economic vitality over the long term.