APPENDIX G. BEST PRACTICES RESEARCH

The following Appendix summarizes research conducted as part of this project that looked at national and Virginia examples of best practices in multimodal planning.
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A. Introduction
Cities and states throughout the country are recognizing the importance of integrating multimodal transportation and transit-oriented development policies with land use planning and urban design. Many agencies and localities have implemented policies and guidelines aimed at providing multimodal transportation options and encouraging supporting development patterns. This document provides a summary of the best practices review of multimodal planning and design, transit-oriented development and multimodal corridor guidelines.

This review focused on identifying examples and best practices in the industry relative to:

- Multimodal Corridor Planning
- Multimodal Corridor Design
- Multimodal Districts
- TOD Typologies and Place Types
- Performance Measures relative to Accessibility and Multimodal Quality of Service

This review also sought to identify the commonalities between various efforts relative to the specific measures and methods for multimodal and TOD guidelines; and identify notable presentation and illustrative elements for effectively communicating information to a broad constituency. This literature review will aid in developing the statewide guidelines and best practices in planning for multimodal districts, corridors and TOD within the Virginia context.

Included in the last section (Section F) is a table summarizing all relevant plans, policies and other literature reviewed as part of this best practices research. From this master list, the study team conducted a more detailed review of select plans and guidelines for inclusion herein as an annotated bibliography.

B. State of the Practice Synthesis and Relevance to Virginia

Research Synthesis
Cities, regions, and national research institutions continue to probe into theories of land use and transportation interaction. The example resources demonstrate the variety of ways to approach land use planning and urban design to promote context sensitive design, enhance community character, maintain appropriate scale, support different transportation choices and grow strategically.

Generally, the context sensitive resources for multimodal design and TOD area plans follow a standard structure of defining land use context and roadway classification, and designing the road or surrounding area accordingly. This approach is consistent with the ITE recommended practice in *Designing Walkable Urban Thoroughfares: A Context Sensitive Approach*. This general structure can be used as a starting point for the Virginia Multimodal and Public Space Design Guidelines.
The example resources define land use contexts with a wide spectrum of methodologies. Each community is unique and places differ by many variables. Capturing these similarities and theorizing the structure and organization of how they fit together are challenging tasks. Most cities and metropolitan areas define TOD place types by levels of densities, land use composition, and transit type. Denver’s TOD typology is organized in this fashion. Indianapolis’s multimodal guidelines address these variables and give additional descriptive information. Utah’s Wasatch Front avoids creating specific place types, but specifies the ways in which TODs differ, including place and location, development type, and transit type. The general place types outlined in Reconnecting America and the Center for Transit Oriented Development’s Station Area Planning are defined by levels of density/intensity, typical uses, and transit type, as well as the reach of economic influence. Station Area Planning briefly addresses connections between place types. For example, urban neighborhoods are connected to urban centers and regional centers.

Creating a typology that incorporates all potential station areas within an entire state is a daunting task. The Florida Department of Transportation (FDOT) and the California Department of Transportation (CalTrans) are two state agencies that have made progress on this front, and both use a two-dimensional graph to illustrate the connections between the various scales. FDOT’s A Framework for Transit Oriented Development in Florida approaches place types according to level of activity and accessibility, and transit type. Community context is another major variable and represents a third dimension. CalTrans uses a similar approach but with regional accessibility as one scale and community design as the other. Different place types have different locations within the graph. For example, rural towns have strong community design but weak regional accessibility (see page 34 for image). Both methodologies reveal differences between urban and suburban place types, but this designation is not the primary variable. Accessibility inherently explains differences in urban place types. These methodologies both hold promise and relevance for the Virginia effort.

Metro Portland and the Center for Transit Oriented Development have also developed interesting approaches to place types with a two-dimensional graph, which may also be of use in developing guidelines for Virginia. Metro Portland places level of transit orientation along one axis and market strength along the other. The level of transit orientation assesses things like connectivity of sidewalks, concentration of activities, and mix of uses. Metro uses this methodology to prioritize stations in allocating funds from their TOD program. Of particular use to the Virginia effort may be the repackaging of the “Ds” of density into “Ps” of transit orientation: people (residents and employees per acres), places (retail and services that serve daily needs), pedestrian and bicycle connectivity (presence of sidewalks and low-stress bikeways), performance (transit frequency – bus and rail), and physical form (underlying block structure). In Performance-Based Transit Oriented Development Typology Guidebook, the Center for Transit Oriented Development (CTOD) places VMT along one axis and worker intensity along the other.

National resources also emphasize that transit oriented development does not just happen at the station area level. Transit corridors connect the station areas, and station areas fit within larger districts. The market shed of transit trips extends past the typical half-mile radius of a station area.
Ensuring that corridors and areas surrounding the station area are well-planned, context sensitive and provide for safe and convenient travel for all modes is critical.

Like place types, definitions of transit or multimodal corridors vary. Defining corridors and districts for the Virginia Multimodal Guidelines will be a critical task. In *Transit Corridors and TOD*, CTOD defines a transit corridor as the walkable areas around all of the stations along a transit line. However, multimodal corridors produce benefits even when a transit station is not within walking distance. Charlotte, NC, and Roanoke, VA, are two of many cities nationwide who (that?) are developing multimodal corridor guidelines to achieve “Complete Streets” throughout the city regardless whether that street is served by transit.

Multimodal corridors can vary in size depending on the transit type and function. A local bus corridor may be only one mile wide, since passengers typically walk to the transit station. A commuter transit corridor might be 3 to 5 miles wide depending on the speed of the mode that a passenger takes to reach the transit station. Even within one type of transit line, travel patterns between station areas will vary, as recognized in the WMATA *Station and Site Access Planning Manual*. Core stations are accessible by primarily walking, bicycling and bus, whereas passengers rely on non-walking modes to access mid-line and terminus stations. Addressing the complexities between different scales and different market sheds through corridors or districts will be a challenging endeavor and critical for understanding how the pieces fit together for the Virginia statewide effort.

The definition for multimodal transit corridors should also address the overlap between automobile demand and transit service. Within the statewide context, VTrans2035, Virginia’s long range transportation plan has identified eleven corridors of statewide significance. Some of these corridors are interstates where high speed regional vehicular travel can be comparable to intercity rail. Other corridors of statewide significance are roads where higher speed regional and lower speed local traffic mix. The Virginia effort will need to address the competing needs of regional and local trips by creating new prototypes or hierarchy of multimodal corridors that accommodate the various modes at each scale. The guidelines will also need to address both the existing and future conditions of communities within Virginia relative to the evolution and growth of transit systems relative to growth of the community as a whole.

The concept of districts is less widely explored. The Indianapolis guidelines provide one way to define a district. A multimodal district is an area where daily destinations are within walking distance and usually within biking distance of a transit node. The concept of districts can bridge the gap between high density station areas and areas outside of the transit market shed.

Based on the best practices review, the Virginia guidelines should first identify the theoretical construct and typologies for station areas, corridors, and districts. From this will come specific design guidelines, measures and variables that can best support multimodal mobility within differing community place types. Determining the scale (in terms of level of detail for statewide prototypes) of recommendations will be a critical decision. The Florida and California statewide examples avoid detailed design guidelines like building transparency and garage treatments and address more macro issues like population and
employment densities. More specific design guidelines are likely best reserved for more detailed station area plans. Broad elements that should be addressed include land use mix and placement, circulation and connectivity, station access and parking and other measures of multimodal mobility and accessibility.

The most interesting example resources did not just focus on design aspects of TOD, but acknowledged that market conditions also play a significant part in actualizing TOD build out over time. Utah’s Wasatch Front guidelines explain market conditions as the fourth context in which TODs differ. Metro Portland uses market readiness as a variable in prioritizing investments in TOD.

Implementation strategies varied across the plans reviewed, but were present in most works. Implementation steps provide the guidance on how to translate policies and recommendations into reality. The best policies provide action items/next steps within an implementation plan, including assigning roles and responsibilities of different players (local governments, transit agencies, developers, and others), creating and adopting strategies (parking management, affordable/mixed income housing in TODs, etc), developing funding tools, and developing performance measures to track success. This level of implementation guidance should be included in the Virginia work.

Based on the national best practices review, the Virginia Multimodal and Public Space Design Guidelines should include the following key elements:

1. Present overarching principles of values, vision and the reasons for encouraging more efficient land use and transportation patterns and the benefits of targeting growth into areas already served or to be served by transit.
2. Acknowledge variations in community/land use contexts, and create a system of categorization or classification (typologies, place types, etc.) such that a range of rural to urban conditions are addressed.
3. Discuss the differences in corridor and roadway network functions, character, and influence on surrounding land use, and present a typology or classification for the corridors and multimodal transportation networks necessary to support transit oriented or pedestrian oriented development patterns while at the same time ensuring reasonable levels of vehicular mobility.
4. Provide design guidance for the possible combination of land use place types and multimodal corridor typologies.
5. Present implementation strategies and phased approaches to assist communities in evolving multimodal corridors and districts over time.

The Virginia Context
The Virginia Multimodal and Public Space Guidelines will fill a critical gap in the practices and policies of the Commonwealth. Virginia already has several key policies and resources for integrated multimodal planning and transit supportive development. VTrans2035 and the 2035 Virginia Surface Transportation Plan evidence the Commonwealth’s commitment to approach transportation planning that integrates all modes from beginning to end. DRPT’s Transit Service Design Guidelines provide a solid foundation for defining development levels supportive of transit and providing different options for modes such that all
communities could be served by some form of transit, even if it is only demand response bus. VDOT’s policies on context sensitive design and integrating bicycle and pedestrian accommodations have adapted roadway design and construction projects to increase the safety and accessibility for pedestrians and bicyclists. WMATA’s Station Site Access Planning Manual provides valuable information about how to design for efficient access that fits within the current design protocols.

With the Urban Development Area legislation, Virginia localities are also thinking more about how to focus growth into compact development areas that could also be prime locations for transit service. The Virginia guidelines will help bridge the gap between the generalities of the Transit Service Design Guidelines and the specificity of the Station Site Access Planning Manual. Localities will be able to use this resource to determine the ideal location for multimodal corridors and TODs within their jurisdiction. It will provide guidance on the densities, connections, and other urban design, land use and transportation considerations necessary to make it work, at the station area, corridor and district scales.

DRPT’s Amtrak Area Plans provide excellent examples of how TOD can work in Virginia. Arlington County has set the precedent for transit oriented development through numerous policies and plans, and Loudoun County is following by creating new zoning categories for TOD and incorporating TOD language into its comprehensive plan. Other individual localities have initiated TOD planning on their own, namely Tysons’ Corner in preparation for the Metro silver line extension and the City of Norfolk in anticipation of its new light rail system.

The lessons learned and best practices from these case studies will influence the development of the guidelines. The Multimodal and Public Space design guidelines will build upon previous Virginia efforts and incorporate exemplar methodologies and approaches from national sources. The ultimate goal of the Virginia guidelines is to provide a resource for transit agencies, localities and other interested parties to identify key land use, urban design and transportation plans, policies and guidelines to create the optimal conditions for getting the best return on their transit investments and syncing up local community growth visions with desired multimodal transportation options.
C. Annotated Bibliography of Select Best Practices

The lists below highlight the selected best practices included in the following pages as an annotated bibliography. Additional resources reviewed are also included in tabular format in the Section F.

Transit-Oriented Development (TOD) Policies and Guidelines:


Multimodal Transportation Guidelines:

- City of Boulder. *Multimodal Corridors*.

TOD and Multimodal Transportation Policies and Guidelines in Virginia:

- Arlington County’s Transit Corridor Growth Strategy.
- Virginia’s Integrated Multimodal Planning Framework.

This brief document focuses specifically on TOD station areas and how to achieve TOD that maximizes ridership potential. It defines eight TOD place types and provides nine station area planning principles.

Transit-Oriented Places Typologies

Eight place types are defined: four centers (regional center, urban center, suburban center, and transit town center); three districts (urban neighborhood, transit neighborhood, and special use/employment district); and one corridor (mixed-use corridor).

Place types are defined according to the type of development within the area, the type of transit that serves them and the characteristics of transit service. For example, a transit neighborhood has lower densities, economic activity is not concentrated around stations, and secondary transit service is less frequent, whereas an urban neighborhood has multiple transit options to regional and urban centers.

Each place type has a description and graphic showing typically how robust and connected the transit system is, and the intensity of surrounding land use. The diagrammatic graphics show each place type with ¼- and ½-mile radius circles around the transit station. In this case, a center and a district have the same spatial scale; districts are neighborhood or special use land uses that are not in an economic ‘center.’ For example, the Pearl District in Portland and Greenwich Village in NYC are considered urban neighborhoods; they are outside of the huge booming center of the city but still have a robust transit network to facilitate TOD.
A matrix compares characteristics of each place type (transit mode, peak frequency, land use mix and intensity, and examples) to help readers identify under which category a specific place would fall. Another matrix provides standardized development guidelines (housing mix, density and FAR) within station area for TOD place types. This second matrix is prescriptive for TOD; the first is simply descriptive.

The document also provides residential, mixed use/employment and open space building typologies that illustrate the options for achieving TOD density as specified in the place type development guidelines.
Station Area Planning Principles

The document also provides nine planning principles and describes several corresponding strategies for each principle in checklist form for planners to consider throughout the TOD planning effort. The nine planning principles are:

1. Maximize ridership with transit-oriented development
2. Generate meaningful community involvement
3. Design streets for all users
4. Create opportunities for affordable and accessible living
5. Make great public spaces
6. Manage parking effectively
7. Capture the value of transit
8. Maximize neighborhood and station connectivity
9. Implement the plan and evaluate its success

Design streets for all users:

**THE STREETS SURROUNDING** transit stations need to support multiple transportation modes — automobiles, buses, pedestrians and bicyclists, taxis — and provide for the safety of all users. The design of intersections and crossings, sidewalks and transit stops should consider the safety of the young, the elderly, and the mobility impaired. This approach to designing streets may necessitate trade-offs due to space constraints, but the needs of pedestrians, bicyclists and transit users should be prioritized over the convenience of automobile drivers.

*Consider TOD-specific street design standards:*
Narrower travel lanes and slower design speeds are often appropriate in transit-oriented neighborhoods. They should be considered in the planning process and the advantages weighed against potential impacts such as lower bus operating speeds and higher operating expenses.

*Consider multimodal performance standards:*
The planning partners should consider adopting performance standards such as levels of service for all modes, including bikes and pedestrians, and other TOD-appropriate standards that don’t prioritize access by automobile at the expense of other modes.

*Incorporate bike and pedestrian access:*
All streets in the station area should accommodate bicyclists and pedestrians with wide sidewalks, curb cuts and ramps, audible signals, bike lanes, trails, and bike parking appropriate for anticipated demand. Convenient and fully accessible paths of travel for wheelchair users and the mobility-impaired should be prioritized.

*Prioritize safety and security:*
Plans should address the safety and security of users with design responses including lighting and providing visibility for users and for “eyes on the street.”
2. Transit Corridor and TOD: Connecting the Dots

*by Reconnecting America and Center for Transit-Oriented Development (Dec 2010)*

This report synthesizes the importance of planning for TOD at a corridor scale. This is important because corridor planning integrates the regional and local contexts, creates momentum for TOD implementation, and increases efficient use of public and private resources. The organization of different types of corridors, and the objectives and strategies discussed may prove useful in the discussion of multimodal transit corridors for the statewide Virginia guidelines effort.

Corridor planning typically begins when a new transit investment is proposed. When planning for TOD, a transit corridor is best defined as the walkable areas around all of the stations along a transit line. Any transit technology can define a transit corridor – heavy or light rail, streetcar, trolley or bus. The TOD potential depends more on the design and quality of service than it does on the transit technology.

**Three basic corridor types** (destination connector, commuter, and district circulator) are defined by what it connects and how these connections influence the overall potential for TOD. A description, examples, and implications for TOD are provided for each corridor type.

**Objectives and Strategies for Transit and TOD at the Corridor Level**

Each of the following objectives and strategies are discussed and examples of case studies are provided.

<table>
<thead>
<tr>
<th>Objective</th>
<th>Strategy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Guide growth and development</td>
<td>Understand potential market reaction to transit</td>
</tr>
<tr>
<td>Support regional economic growth</td>
<td>Connect residents to activity centers with transit</td>
</tr>
<tr>
<td>Enhance regional and local equity</td>
<td>Develop a mixed-income TOD strategy</td>
</tr>
<tr>
<td>Promote reinvestment and increase spending power</td>
<td>Create an economic revitalization policy</td>
</tr>
<tr>
<td>Invigorate stakeholder engagement and collaboration</td>
<td>Coordinate key stakeholders</td>
</tr>
<tr>
<td>Maximize TOD potential and benefits</td>
<td>Establish a phased TOD implementation and investment plan</td>
</tr>
</tbody>
</table>
3. Wasatch Front Transit Oriented Development Guidelines
by Envision Utah (2002)

These TOD guidelines identify targeted areas for TOD within the Wasatch Front, a large urban area approximately 120 miles long and an average of five miles wide in which 80 percent of Utah’s population reside. This resource is particularly relevant to the Virginia statewide guidelines effort as it provides qualitative guidelines for a large region with different types of transit systems and acknowledges variations in context. The report highlights several main concepts of TOD design including circulation, urban design, and parking and transportation demand policy, without providing quantitative parameters and standards for TOD place types. The report has a comprehensive section on implementation and focuses on economic feasibility of TOD.

The Utah Transit Authority operates a combination of bus and light rail service throughout the Wasatch Front region. After the development of the TOD guidelines, the FrontRunner commuter rail service began in 2008 in the northern portion of the region. The report identifies light rail and commuter rail stations as having the best opportunities for transit-oriented growth, as well as high-speed bus corridors and community hubs, places where bus lines, bikeways, trails and sometimes rail will meet.

Applying TOD to Different Contexts
The document outlines four ways in which TODs can differ: by place, by development type, by transit type, and based on economic analysis. General place types are identified, but not discussed relative to the other context variables, acknowledging that the four types of variables are independent of one another. The economic analysis discussion emphasizes the synergistic relationship between a locally appropriate public regulatory framework for TOD and private market forces. This content may be useful to the implementation piece of the Virginia statewide guidelines effort.

<table>
<thead>
<tr>
<th>Place</th>
<th>Development Type</th>
<th>Transit Type</th>
<th>Economic Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Urban Core</td>
<td>• Redevelopment of Opportunity Sites</td>
<td>• Light Rail</td>
<td>• Regional Economic and Demographic Trends and Projections</td>
</tr>
<tr>
<td>• Urban Neighborhood</td>
<td>(potential for large-scale redevelopment)</td>
<td>• Commuter Rail</td>
<td>• Local Real Estate Market Conditions</td>
</tr>
<tr>
<td>• Suburban Town Center/Community Hub</td>
<td>• Incremental Infill/ Neighborhood Revitalization</td>
<td>• Rapid and Feeder Buses</td>
<td>• Specific Opportunity Sites</td>
</tr>
<tr>
<td>• Suburban Employment/ Retail Center</td>
<td>• New Growth Areas (Greenfields)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• University or Institutional Campus</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Park-and-Ride</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Ideal TOD Planning Area and Land Use Composition
The ideal planning area for TOD is the area within a half-mile circle around the station area. Barriers to achieving a 360-degree pedestrian oriented district may exist, and connections across such barriers should be maximized.

The document discusses different ways in arranging the land use around transit stations. The most intensely developed mixed-use core should loosely comprise the quarter-mile walking radius around the transit station. General guidance on building height and land use mix depending on place type is provided in narrative form. The area surrounding the mixed-use core needs properly designed
secondary employment and residential areas. Relatively lower intensities as compared to the mixed-use core will avoid competition between the same uses. This area should accommodate enough people to support the transit station, but at a smaller neighborhood scale. Natural, open space and rural areas are an important aspect in the regional growth picture and should be included in TOD planning. A variety of housing choices for a complete range of incomes is stressed.

General TOD Guidelines
The TOD guidelines provide underlying principles for circulation, urban design, and parking and transportation demand strategies that are applicable for all TODs. Several topic areas are discussed in detail, as listed below. The discussions focus on how these elements affect the station area, and provide general guidance. For example, the discussion of connected street systems emphasizes parallel roads and offers strategies on retrofitting contemporary cul-de-sac subdivisions. The report acknowledges that specifics of how the guidelines apply will differ depending on the TOD context. These specifics are not provided; they will be addressed in specific station area plans.

Circulation
- Connected street systems
- Small block size
- Traffic calming
- Appropriate Roadway Standards
- Alleys
- Off-street Trails, Bicycle and Pedestrian Pathways

Site and Building Design
- Street-oriented building placement
- Visible and accessible entries
- Garage treatments
- Architectural variation
- Transparency
- Compatible height, massing and style

Public Space Design Strategies
- Streetscaping
- Civic Plaza at transit station
- Landmark features

Station Design
- Connections to adjacent spaces and buildings
- Station amenities
- Transit station as community landmark
- Parking and Loading Areas

Parking and Transportation Demand Policy
- Parking Maximums and Minimums
- Shared Parking
- District Wide Parking
- Parking Structures and On-Street Parking
- Car Sharing
- Parking Pricing
- Other Transportation Demand Management Strategies

The document acknowledges that roadway standards with traditional functional classifications (arterial, collector, and local) do not adequately differentiate between different types of access needs, neighborhood character, or the character of adjacent land uses. To better define the character and livability of a neighborhood or district, street types should be considered. The following chart shows the
differences in user needs and specifies several design characteristics that synthesize the speed and design of the road with the desired context depending on the street type and functional classification.

<table>
<thead>
<tr>
<th>Functional Class</th>
<th>Street Type</th>
<th>Transit</th>
<th>Side-walks</th>
<th>Bike Facilities</th>
<th>Desired Speed</th>
<th>Traffic Calming</th>
<th>On-Street Parking</th>
<th>Planter Strip</th>
<th>Center Lane</th>
<th>Lane Width</th>
<th>Travel Lanes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ARTERIAL</strong></td>
<td>Residential</td>
<td>Accoun</td>
<td>5'-10'</td>
<td>Lanes</td>
<td>25</td>
<td>Some</td>
<td>Yes</td>
<td>Yes</td>
<td>Plan, TL</td>
<td>11'-12'</td>
<td>6-10</td>
</tr>
<tr>
<td></td>
<td>Main Street</td>
<td>Priority</td>
<td>10'+</td>
<td>Lanes</td>
<td>25</td>
<td>Some</td>
<td>Yes</td>
<td>Yes</td>
<td>Plan, TL</td>
<td>11'-12'</td>
<td>6-10</td>
</tr>
<tr>
<td></td>
<td>Mixed-Use</td>
<td>Priority</td>
<td>10'+</td>
<td>Lanes</td>
<td>35</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Plan, TL</td>
<td>12.5'-14'</td>
<td>6-10</td>
</tr>
<tr>
<td></td>
<td>Commercial</td>
<td>Priority</td>
<td>5'-10'</td>
<td>Lanes</td>
<td>30-45</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Plan, TL</td>
<td>12.5'-14'</td>
<td>6-10</td>
</tr>
<tr>
<td><strong>COLLECTOR</strong></td>
<td>Residential</td>
<td>Accoun</td>
<td>5'-9</td>
<td>Lanes</td>
<td>25</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Plan, TL</td>
<td>9.5'-10.5'</td>
<td>4-6</td>
</tr>
<tr>
<td></td>
<td>Main Street</td>
<td>Accoun</td>
<td>10'+</td>
<td>Lanes</td>
<td>25</td>
<td>Possibly</td>
<td>Yes</td>
<td>Yes</td>
<td>TWTL</td>
<td>9.5'-10.5'</td>
<td>4-6</td>
</tr>
<tr>
<td></td>
<td>Mixed-Use</td>
<td>Accoun</td>
<td>10'+</td>
<td>Lanes</td>
<td>30</td>
<td>Possibly</td>
<td>Yes</td>
<td>Yes</td>
<td>TWTL</td>
<td>11'-12'</td>
<td>4-6</td>
</tr>
<tr>
<td></td>
<td>Industrial</td>
<td>Infreq</td>
<td>5'-6</td>
<td>Lanes</td>
<td>30</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Plan, TL</td>
<td>12.5'-14'</td>
<td>4-6</td>
</tr>
<tr>
<td><strong>LOCAL</strong></td>
<td>Residential</td>
<td>Infreq</td>
<td>4'-6</td>
<td>Route</td>
<td>25</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>None</td>
<td>9.5'-10.5'</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Main Street</td>
<td>Infreq</td>
<td>5'-6</td>
<td>Route</td>
<td>25</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>None</td>
<td>9.5'-10.5'</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Mixed-Use</td>
<td>Infreq</td>
<td>5'-6</td>
<td>Route</td>
<td>25</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>TWTL</td>
<td>11'-12'</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Industrial</td>
<td>Infreq</td>
<td>5'-6</td>
<td>None</td>
<td>25</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>None</td>
<td>12.5'-14'</td>
<td>2</td>
</tr>
</tbody>
</table>

The table in Section F contains several case studies of transit station areas where plans have been developed and the resulting future land use maps and photo renderings for future development.
4. **Transit Oriented Development Strategic Plan**  
*by City of Denver, Colorado: Community Planning and Development (Aug 2006)*

Between the T-Rex line and FasTracks, Denver is planning 23 new transit station and five new transit corridors. This guide will help city staff to prioritize the planning and implementation activities for TOD. It provides background info on what TOD is and TOD in the Denver context; specific city-wide action strategies to implement TOD, and briefly identifies issues, opportunities and recommendations for transit corridors and station areas. Station area plans are completed or underway for most station areas as separate documents.

**TOD Typologies**

Recognizing that not all TODs look and function the same way, the Denver TOD typology defines basic station area place types by the overall character and vision without spelling out specific details. The two basic functions of the typologies are to (1) provide enough detail so that if development proposals are submitted prior to completion of the plan, there is some basis for evaluation of its appropriateness, and (2) form a shared vision from which planning process participants can work form to develop the specifics of a station area plan.

<table>
<thead>
<tr>
<th>TOD Typology</th>
<th>Desired Land Use Mix</th>
<th>Desired Housing Types</th>
<th>Commercial Employment Types</th>
<th>Proposed Scale</th>
<th>Transit System Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Downtown</td>
<td>office, retail, residential, entertainment</td>
<td>multi-family and townhome</td>
<td>mixed office and shopping locations</td>
<td>5 stories and above</td>
<td>Intermodal (transit, bike) Major regional destination with high quality local/commuter connections.</td>
</tr>
<tr>
<td>Major Urban Center</td>
<td>office, retail, residential</td>
<td>multi-family and townhome</td>
<td>employment emphasis, with more than 250,000 office &amp; 30,000 st workers</td>
<td>5 stories and above</td>
<td>Sub-regional destination, some Park-and-Ride linked with district circulator or express rider bus.</td>
</tr>
<tr>
<td>Urban Center</td>
<td>office, retail, residential</td>
<td>multi-family and townhome</td>
<td>limited office, less than 25,000 SF office, more than 50,000 SF retail</td>
<td>3 stories and above</td>
<td>Sub-regional destination, some Park-and-Ride linked with district circulator or express rider bus.</td>
</tr>
<tr>
<td>Urban Neighborhood</td>
<td>residential, neighborhood retail</td>
<td>multi-family townhomes, single-family</td>
<td>local-serving retail, no more than 50,000 SF</td>
<td>2-7 stories</td>
<td>Neighborhood walk-up station. Very small Park-and-Ride, if any local bus connections.</td>
</tr>
<tr>
<td>Commuter Town Center</td>
<td>office, retail, residential</td>
<td>multi-family townhomes, small lot single-family</td>
<td>local and community-serving, no more than 25,000 SF</td>
<td>2-7 stories</td>
<td>Capture station for in-bound commuters, large Park-and-Ride with local and express bus connections.</td>
</tr>
<tr>
<td>Main Street</td>
<td>residential, neighborhood retail</td>
<td>multi-family</td>
<td>Main street retail infill</td>
<td>2-7 stories</td>
<td>Bus of mixed corridors, limited circulator at Peoria transit station, walk-up stops, no express parking.</td>
</tr>
<tr>
<td>Campus/ Special Events Station</td>
<td>university, campus, sport facilities</td>
<td>limited multi-family</td>
<td>limited off-street</td>
<td>Varies</td>
<td>Large commuter destination, large parking reserves but not necessary for transit.</td>
</tr>
</tbody>
</table>
Thirty-two existing and future transit station areas were assigned a TOD typology and priority. Issues, conditions and recommendations for each station area are identified. The discussion of station areas is organized by transit corridor.

Citywide Policy and Action Recommendations
After a review of the City’s plans and policies that recognize and support TOD principles, it identifies citywide policy and action recommendations to address policy gaps:
1. Fine-tune roles and responsibilities between the transit authority and the council of governments.
2. Adopt the TOD typology and encourage the region to embrace a common definition of TOD.
3. Engage in proactive planning and zoning.
4. Adopt a package of TOD parking and parking management strategies
5. Focus funding tools on TOD and create new tools
6. Prepare an affordable and mixed-income housing strategy for TOD
7. Develop a public housing renewal strategy

This plan provides a good model for incorporating necessary policies at the city-wide level and assessing economic market for each station area. Design recommendations for the corridors and station areas are lacking. There are no quantitative parameters or standards as these to be addressed in individual station area plans.

This document was completed in 2006. Since then, many station areas have completed station area plans. The progress is available online at http://www.denvergov.org/StationAreas/tabid/395230/Default.aspx.
5. Performance-Based Transit-Oriented Development Typology Guidebook by Center for Transit-Oriented Development (Dec 2010)

The purpose of this research effort was to develop a performance-based typology that TOD practitioners and decision makers can use to identify the different conditions that exist in places and to determine the form that TOD takes. This tool will help to answer questions like: What economic, environmental and social outcomes can we expect from investments in transit and TOD? What differentiates transit-oriented development from transit-adjacent development? What standards should be utilized in evaluating zoning for TOD or other policy interventions?

Rail TODs are organized into nine place types according to VMT and the percentage of workers to residents. The report compares other characteristics relative to the place types (e.g. auto ownership, transportation costs, commute travel behavior, employment proximity, and urban form). Case studies are provided for each place type. The report also includes scenario studies to analyze the effect of additional growth in reducing VMT. A template is provided for communities to assess station areas in comparison to others, and this tool can be used to determine how to lower VMT in an individual zone.

**TOD Typology**

The typology creates 15 distinct place types by identifying the number of miles the typical household within each transit zone will travel in a year and whether the area is primarily residential, employment, or a balance of the two. Understanding where an individual transit zone sits in this spectrum, or how all of the transit zones in a region compare to one another can make it easier for stakeholders to identify strategies to reduce VMT or to take advantage of existing low VMT places. The 15 place types are organized by VMT on the vertical axis and use mix on the horizontal axis.

<table>
<thead>
<tr>
<th>Household VMT Type</th>
<th>VMT Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 - Low</td>
<td>&lt; 9,100</td>
</tr>
<tr>
<td>2 - Low-Moderate</td>
<td>9,100 to 11,600</td>
</tr>
<tr>
<td>3 - Moderate</td>
<td>11,600 to 14,300</td>
</tr>
<tr>
<td>4 - High-Moderate</td>
<td>14,300 to 17,200</td>
</tr>
<tr>
<td>5 - High</td>
<td>&gt; 17,200</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Use Mix Type</th>
<th>Percentage of workers relative to workers and residents</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 primarily residential</td>
<td>33.3% or less</td>
</tr>
<tr>
<td>2 balanced</td>
<td>33.3% to 66.7%</td>
</tr>
<tr>
<td>3 primarily employment</td>
<td>66.7% or more</td>
</tr>
</tbody>
</table>
The purpose of this typology is to compare place types within a system or across multiple systems. Putting transit zones into their regional contexts illuminates the differences in TOD performance. The report compares the station area place types within the Chicago region and between the Chicago and San Francisco Bay Area regions.

**Table 4. Normative Metrics**

<table>
<thead>
<tr>
<th>Place Types</th>
<th>Residential Places</th>
<th>Balanced Places</th>
<th>Employment Places</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low VMT</td>
<td>Low-Med VMT</td>
<td>Med VMT</td>
</tr>
<tr>
<td>(residents + workers)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Workers</td>
<td>0.923</td>
<td>4.820</td>
<td>2.981</td>
</tr>
<tr>
<td>Workers/Residents</td>
<td>15.3%</td>
<td>19.5%</td>
<td>18.9%</td>
</tr>
<tr>
<td>Households</td>
<td>18.214</td>
<td>7.854</td>
<td>3.506</td>
</tr>
<tr>
<td>Household Size</td>
<td>2.71</td>
<td>2.61</td>
<td>2.62</td>
</tr>
<tr>
<td>Great Density</td>
<td>0.95</td>
<td>1.10</td>
<td>1.03</td>
</tr>
<tr>
<td>(adults, acres)</td>
<td>53.2</td>
<td>23.6</td>
<td>12.1</td>
</tr>
<tr>
<td>Block Size (acres)</td>
<td>4.4</td>
<td>4.1</td>
<td>3.7</td>
</tr>
<tr>
<td>Monthly T Cost</td>
<td>540</td>
<td>562</td>
<td>583</td>
</tr>
<tr>
<td>Yearly T Cost</td>
<td>50,080</td>
<td>59,762</td>
<td>68,396</td>
</tr>
<tr>
<td>Travel Time to Work (minutes)</td>
<td>30.6</td>
<td>21.4</td>
<td>27.4</td>
</tr>
<tr>
<td>Employment Proximity</td>
<td>233,895</td>
<td>127,485</td>
<td>65,640</td>
</tr>
<tr>
<td>Access Index</td>
<td>34</td>
<td>19</td>
<td>13</td>
</tr>
<tr>
<td>Acres/Household</td>
<td>0.46</td>
<td>0.82</td>
<td>1.18</td>
</tr>
<tr>
<td>House Journey to Work (miles)</td>
<td>54%</td>
<td>36%</td>
<td>26%</td>
</tr>
<tr>
<td>House Journey to Work (min)</td>
<td>56%</td>
<td>44%</td>
<td>32%</td>
</tr>
<tr>
<td>Workplace Journey to Work (miles)</td>
<td>33%</td>
<td>22%</td>
<td>11%</td>
</tr>
<tr>
<td>Workplace Journey to Work (min)</td>
<td>39%</td>
<td>30%</td>
<td>20%</td>
</tr>
</tbody>
</table>

**Normative Metrics**

In addition to VMT and use mix, each place type has other characteristics such as travel time to work, average median income, auto ownership per household, and gross density that can be used to evaluate performance. These other characteristics are ‘normative metrics.’ When generalized by place type, they can identify common trends.
Key Findings

Auto Ownership & Transportation Costs:
Transit zones in low VMT places types tend to have low transportation costs and low rates of automobile ownership. Auto ownership in the lowest VMT places average 0.5 cars per household.

Commute Travel Behavior:
Low VMT place types exhibit more transit ridership and higher rates of walking and biking to work than high VMT transit zones. This finding is equally true of commutes by residents living in transit zones and commutes by workers who work in transit zones. Transit commute mode share in the lowest VMT place types is from 5 to 11 times greater than the national average.

Employment Proximity:
Low VMT transit zones are located much closer to employment than high VMT transit zones. A typical low VMT place is proximate to ten times more jobs than the highest VMT places.

Urban Form:
Low VMT transit zones tend to have more intensity (residents + workers) and higher residential densities than high VMT transit zones. Residential densities in low VMT transit zones are over 15 times as high compared to high VMT transit zones. Additionally, transit zones have smaller block sizes.

Scenarios to Reduce VMT
Several scenarios were conducted to see how new development within station areas would impact VMT. The scenarios show broad pictures of VMT reductions possible with increases in housing and employment.

The typology tool can help prioritize areas for growth by showing where these changes can be most impactful. For example, researchers analyzed how adding 2,000 households to two different station areas in St. Louis would affect VMT. The overall VMT savings obtained from having new residential growth happen near transit stations is significant in both examples. But because the number of people living around Forest Park is much higher, the benefits from even small reductions in VMT are also higher.
   by Institute of Transportation Engineers and Congress for New Urbanism (Mar 2010)

This report provides guidance for the design of walkable urban thoroughfares in places that currently support the mode of walking and in places where the community desires to provide a more walkable thoroughfare, and the context to support them in the future. It focuses primarily on arterials and collectors. This document is the industry standard for Context Sensitive Solutions (CSS) and walkable thoroughfare design. It includes many details related to corridor design and process. Application is generally limited to low-speed, urban arterials and collectors, streets that require tradeoffs between pedestrian and vehicle priority. Separate sections highlight various elements of the planning and design process.

CSS in the Transportation Planning Process
The planning section contains chapters about transportation planning and project development process, addressing how CSS can be applied at each stage and how CSS can be applied at different scales (network, region, and corridor).

![CSS in the Transportation Planning Process Diagram](image-url)
Framework for Walkable Urban Thoroughfare Design

The process essentially boils down to three key steps:

1. Identify the roadway’s context zone, functional classification, and thoroughfare type
2. Based on the decisions made in step one, establish parameters for the size and scale of the road, including the roadway’s target/design speed and the design/control vehicle
3. Design the roadway to best fit the characteristics of its context zone and thoroughfare type, focusing on four major elements or “realms”:
   a. Context (e.g. building scale, facades, and orientation)
   b. Streetside (e.g. sidewalks, landscaping, street furniture, and transit stops)
   c. Traveled way (e.g. bicycle, transit and vehicle lanes, and medians)
   d. Intersections (e.g. corner and mid-block crossings, signals, striping, and turn lanes)

Context zones describe the physical form and character of a place. Context zone is a primary consideration in selecting design parameters of urban thoroughfares. Context is defined by multiple parameters, including land use, density and design features.

![Figure 4.4](image)

Figure 4.4 Illustration of a gradient of development patterns ranging from rural in Context Zone 1 (C-1), to the most urban in C-6. Source: Duany Plater-Zyberk and Company.

Functional classification defines a thoroughfare’s function and role in the network and governs the selection of certain design controls. Functional class may determine continuity through a region and the types of places it connects, purpose and lengths of trips accommodated, level of land access and level of access management, type of freight service, and types of public transit services.

Thoroughfare type governs the selection of the thoroughfare’s design criteria and, along with the surrounding context is used to determine the physical configuration of the thoroughfare.
### Table 4.3 Relationship Between Functional Classification and Thoroughfare Type

<table>
<thead>
<tr>
<th>Functional Classification</th>
<th>Thoroughfare Types</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>FREEWAY/EXPRESSWAY/PARKWAY</td>
</tr>
<tr>
<td>Principal Arterial</td>
<td></td>
</tr>
<tr>
<td>Minor Arterial</td>
<td></td>
</tr>
<tr>
<td>Collector</td>
<td></td>
</tr>
<tr>
<td>Local</td>
<td></td>
</tr>
</tbody>
</table>

Shaded cells represent thoroughfare types that are not addressed in this report.

### Table 4.4 Urban Thoroughfare Characteristics

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Freeway</td>
<td>4 to 6+</td>
<td>45–65</td>
<td>Express</td>
<td>Required</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Optional separated path or shoulder</td>
<td>Regional truck route</td>
</tr>
<tr>
<td>Expressway/Properway</td>
<td>4 to 6</td>
<td>45–55</td>
<td>Express</td>
<td>Required</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Optional separated path or shoulder</td>
<td>Regional truck route</td>
</tr>
<tr>
<td>Boulevard</td>
<td>4 to 6</td>
<td>30–35</td>
<td>Express and Local</td>
<td>Required</td>
<td>Limited</td>
<td>Optional</td>
<td>Sidewalk</td>
<td>Bike lanes or parallel route</td>
<td>Regional truck route</td>
</tr>
<tr>
<td>Multilane Boulevard</td>
<td>4 to 6</td>
<td>25–35</td>
<td>Express and Local</td>
<td>Required on access lanes</td>
<td>Yes on access lane</td>
<td>Yes on access roadway</td>
<td>Sidewalk</td>
<td>Regional route/ local deliveries only on access roadway</td>
<td></td>
</tr>
<tr>
<td>Avenue</td>
<td>2 to 4</td>
<td>25–30</td>
<td>Local</td>
<td>Optional</td>
<td>Yes</td>
<td>Yes</td>
<td>Sidewalk</td>
<td>Bike lanes or shared</td>
<td>Local truck route</td>
</tr>
<tr>
<td>Street</td>
<td>2</td>
<td>25</td>
<td>Local or none</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Sidewalk</td>
<td>Shared</td>
<td>Local deliveries only</td>
</tr>
<tr>
<td>Rural Road</td>
<td>2</td>
<td>25–35</td>
<td>Local or none</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>Shared or shoulder</td>
<td>Local deliveries only</td>
</tr>
<tr>
<td>Local Street</td>
<td>2</td>
<td>25</td>
<td>Local or none</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Sidewalk</td>
<td>Shared</td>
<td>Local deliveries only</td>
</tr>
<tr>
<td>Alley/Rear Lane</td>
<td>1</td>
<td>5–10</td>
<td>None</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>Shared</td>
<td>Local deliveries only</td>
</tr>
</tbody>
</table>

Shaded cells represent thoroughfare types that are not addressed in this report.

Notes:
1. Freeway, Multilane Boulevard, Avenue, and Street thoroughfare types have sidewalks on both sides. Sidewalk width varies as a function of context zone, fronting land use and other factors.
2. Freight movement is divided into three categories: 1) Regional truck route, 2) Local truck route and 3) Local deliveries only. Cells show highest order of truck movement allowed.

The remainder of the document provides specific design standards, similar to those found in other road design manuals, for different combinations of context zones, thoroughfare types and predominant land uses. Design standards include not just parameters between the edges of the pavement, but also streetside parameters. Intersection design guidelines are also provided.
7. Urban Street Design Guidelines
by City of Charlotte, North Carolina (October 2007)

Charlotte’s Urban Street Design Guidelines acknowledge conflicts between road users (pedestrians, motorists, neighbors, etc) and provide design guidelines and standards for road segments and intersections. These guidelines are intended to fit with the City’s Transportation Action Plan (TAP) and the Centers, Corridors and Wedges growth framework.

Multiple Users
The document explains the often conflicting needs and desires of all road users including pedestrians, cyclists, motorists, transit and neighbors. An extensive matrix identifies the tradeoffs of design elements from different users’ perspectives. For example, on-street parking helps shield pedestrians from moving traffic, yielding a positive impact for pedestrians and neighbors, but mixed impact for cyclists, motorists and transit because it slows traffic and opening car doors present potential safety hazards for cyclists.

<table>
<thead>
<tr>
<th>Cyclists Want Safer Crossings</th>
<th>Pedestrians</th>
<th>Cyclists</th>
<th>Motorists</th>
<th>Transit*</th>
<th>Neighbors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consider the following elements to increase cyclists’ visibility:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bike Boxes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brings cyclists into driver’s sight; allows cyclists a headstart through an intersection; should provide bike lanes approaching intersection</td>
<td>![Positive Impact]</td>
<td>![Neutral]</td>
<td>![Neutral]</td>
<td>![Neutral]</td>
<td>![Neutral]</td>
</tr>
<tr>
<td>Drop Bike Lane at Intersection</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Achieves same as bike box, but without designated space; casual cyclists may feel less comfortable, although it is considered safer to drop the lane and have cyclists merge earlier for left turns if there is no bike box</td>
<td>![Positive Impact]</td>
<td>![Mixed Impact or Use With Caution]</td>
<td>![Neutral]</td>
<td>![Neutral]</td>
<td>![Neutral]</td>
</tr>
<tr>
<td>Leading Bike Signal</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Allows cyclists a headstart through the intersection; requires driver and cyclist education</td>
<td>![Neutral]</td>
<td>![Neutral]</td>
<td>![Neutral]</td>
<td>![Neutral]</td>
<td>![Neutral]</td>
</tr>
<tr>
<td>Short Blocks</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Create more intersections, but potentially smaller intersections; more opportunities to avoid high volume routes; can potentially calm traffic and allow more opportunities for safe crossing treatments</td>
<td>![Positive Impact]</td>
<td>![Positive Impact]</td>
<td>![Positive Impact]</td>
<td>![Positive Impact]</td>
<td>![Positive Impact]</td>
</tr>
</tbody>
</table>

A six-step process is provided on how to apply these guidelines to reflect the appropriate context and provide for the safety and comfort of all users to the best extent possible.

1. Define Land Use Context
2. Define Transportation Context
3. Identify Deficiencies
4. Describe Future Objectives
5. Define Street Type and Initial Cross-Section
6. Describe Tradeoffs and Select Cross-Section
Steps 5 and 6 may be repeated if the initial cross-section should be refined to better address the transportation and land use objectives.

**Detailed Guidelines**

Chapters 4 and 5 contain the detailed guidelines for street segments and intersections. The segment guidelines are organized by street type, as specified in the Transportation Action Plan. The five street types (Main Street, Avenues, Boulevards, Parkways, and Local Streets) follow a continuum where main streets are the most pedestrian-oriented and parkways are the most auto-oriented. For each street type, the segment guidelines show a generalized cross-section with different zones and discuss a variety of design elements including posted speed, number of through lanes, lane width, sidewalks, on-street parking, curb extensions, lighting, block length, utilities, traffic calming, medians, pedestrian crossings, bus stops, bike lanes, planting strips, driveways and pedestrian refuges. The guidelines specify which design features are appropriate for each street type.

**Main Streets**

The intersection guidelines are organized by street type, similarly to the segment guidelines. The intersection guidelines contain a matrix that specifies which design elements are appropriate for different types of intersection approaches. For example, at a main street intersection, the pedestrian level of service (LOS) objective for the main street approach is LOS A, whereas it is LOS B for avenue or boulevard approaches. The design elements for intersections include pedestrian and bicycle LOS objectives, motor vehicle v/c threshold, median, pedestrian refuge, number of through lanes, left turn...
lane, bike lanes, curb extensions, bus stops, curb radii, crosswalks, ADA ramps, traffic control, and lighting among others.

The final chapter is a glossary, which describes the purpose, benefits and design considerations for different elements within the guidelines. It includes graphics of many design elements.

The appendices define the methodologies for calculating pedestrian and bicycle level of service and contain design guidelines for curb return radii.
8. Multi-Modal Corridor and Public Space Design Guidelines  
by Indianapolis Regional Center & Metropolitan Planning Area (Aug 2008)

A multi-modal transportation system is a network of facilities designed for joint use with connections between two or more modes of transportation. This manual proposes recommendations for development of multi-modal facilities in order to realize the vision of a balanced transportation system.

Planning Guidelines

This section describes the planning concepts behind the development of the guidelines. The guidelines describe multi-modal district types and their proposed locations in the Metropolitan Planning Area. Then, a number of corridor typologies that serve the needs of the districts are described, corridor overlays (or special characteristics pertaining to certain districts or corridors) and some recommended transitions between multi-modal corridors.

Districts and Corridors

The basic corridor framework of the district is composed of placemaking corridors at the center containing the district node, thru corridors at the district edge and connector corridors connecting the two. Local corridors access the balance of the district.

Figure E5.5 Schematic of the relationship between corridors and districts.
District Typologies

1. Central Business
2. Village Mixed-Use
3. Cultural
4. Campus
5. Transit-Oriented
6. Village Residential

Figure 49.1 The network diagram schematically shows the relationship between corridors and districts in a theoretical network. The CBPD shows rings of increasing intensity the closer to the center of the district.
The different pedestrian districts for each locality within the Metropolitan Planning Area are shown in a map series.

**Corridor Typologies**

1. Placemaking Corridors
2. Thru Corridors
3. Connector Corridors
4. Local Corridors
5. Off-Street Corridors
6. Service Corridors
7. Overlays
8. Multi-Modal Transitions

There are several different typologies within each set. For example, there are four different corridor types under Placemaking Corridors: Multimodal Modern Boulevard, Multimodal Pedestrian/Urban, Multimodal Pedestrian/Suburban, and Multimodal Social Street. Each corridor type has a defined set of characteristics, including functional classification and location within district, ROW width, street geometrics and metrics, modes accommodated and modes discouraged, dominant land use pattern, facility determination (for pedestrian, bicycle and transit facilities), typical thoroughfare classification, streetscape and green infrastructure, and special design guidelines. These characteristics are summarized in matrix form.
Each corridor type has a 3-4 page summary that defines the function and characteristics and provides illustrations.

**Designing Guidelines**

This section describes the concepts behind public, quasi-public and private spaces and the elements of the streetscape (called component zones) that constitute the public and quasi-public space and streetscape.

*Figure 137.1 Built Environment Sphere Diagram. This figure is for illustrative purposes only. The diagram demonstrates the concept of spheres of the built environment and does not represent application of design guidelines nor preferred development arrangement. Locations of spheres will vary by district, corridor and use.*
Component Zones

Within the guideline descriptions for both district and corridor typologies, additional detailed guidelines are further categorized into “Component Zones.” These components fit into the “Built Environment Spheres” and are a way to abstractly apply design guidelines to both public and private development based on a “menu” of components that reflect real-world scenarios. It is possible that certain zones may be addressed differently depending upon the relevant district or corridor. For example, bike facilities can either be provided as a multi-use path to serve both pedestrians and bicyclists, or may be provided as a combination of on-street bike lanes and collector sidewalks. The component zones, classified as either a continuous “way” or as discontinuous “zones,” are defined below and represent toolkit options in realizing the district and corridor typologies.

Zone Diagram Definitions

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>BW</td>
<td>Bicycle Way: area where bicycles travel.</td>
</tr>
<tr>
<td>BTW</td>
<td>Bus Transit Way: area where bus transit vehicles travel or stop to load and unload.</td>
</tr>
<tr>
<td>CZ</td>
<td>Crossing Zone: area where pedestrians or other non-motorized modes interface with and traverse through motorized transportation zones.</td>
</tr>
<tr>
<td>CHZ</td>
<td>Clear Height Zone: vertical distance between a transportation facility and the lowest overhead obstruction. Note: There is not a separate design guideline for the CHZ, rather, its requirements are addressed in all other zones.</td>
</tr>
<tr>
<td>FZ</td>
<td>Frontage Zone: area of interaction between the pedestrian way and grade-level uses.</td>
</tr>
<tr>
<td>MUW</td>
<td>Multi-Use Way: area for shared use between multiple alternative transportation users.</td>
</tr>
<tr>
<td>PAZ</td>
<td>Pedestrian Activity Zone: area for public gathering in both the public, quasi-public, and private spheres.</td>
</tr>
<tr>
<td>PW</td>
<td>Pedestrian Way: area where pedestrians travel.</td>
</tr>
<tr>
<td>RTW</td>
<td>Rapid Transit Way: area where rapid transit vehicles travel or stop to load and unload.</td>
</tr>
<tr>
<td>SPZ</td>
<td>Street Parking Zone: area within the roadway where vehicles are permitted to stop, stand, or park, with various levels of permission and/or restriction.</td>
</tr>
<tr>
<td>SZ</td>
<td>Separation Zone: area of protection between the roadway and the pedestrian way that contains various utilities, signs, and streetscaping elements.</td>
</tr>
<tr>
<td>VTW</td>
<td>Vehicle Travel Way: area where motorized vehicles (automobiles, trucks, buses) travel.</td>
</tr>
</tbody>
</table>
Each of the component zones has several pages of design guidelines. A matrix at the end of the design guidelines section specifies minimum zone dimensions for each of the district and corridor typologies.

<table>
<thead>
<tr>
<th>MULTIMODAL</th>
<th>PED-MIX</th>
<th>DISTRICTS</th>
<th>BUW</th>
<th>BTW</th>
<th>BW</th>
<th>BTW</th>
<th>CHZ</th>
<th>CZH</th>
<th>EFZ</th>
<th>PRZ</th>
<th>PKW</th>
<th>SPO</th>
<th>SPZ</th>
<th>SEC</th>
<th>VTW</th>
<th>VTW</th>
</tr>
</thead>
<tbody>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FID1: CBD</td>
<td>Center District</td>
<td>5.00</td>
<td>11.00</td>
<td>10.00</td>
<td>9.00</td>
<td>10.00</td>
<td>9.00</td>
<td>12.00</td>
<td>13.00</td>
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<td>6.00</td>
<td>6.00</td>
<td>6.00</td>
<td>10.00</td>
</tr>
<tr>
<td>FID2: CBD</td>
<td>Mixed Use District</td>
<td>11.00</td>
<td>10.00</td>
<td>10.00</td>
<td>9.00</td>
<td>11.00</td>
<td>10.00</td>
<td>12.00</td>
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<td>10.00</td>
<td>6.00</td>
<td>6.00</td>
<td>6.00</td>
<td>10.00</td>
</tr>
<tr>
<td>FID3: CBD</td>
<td>Cultural District</td>
<td>9.00</td>
<td>11.00</td>
<td>10.00</td>
<td>9.00</td>
<td>11.00</td>
<td>10.00</td>
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<td>6.00</td>
<td>6.00</td>
<td>10.00</td>
</tr>
<tr>
<td>FID4: CBD</td>
<td>Central Business District</td>
<td>5.00</td>
<td>11.00</td>
<td>10.00</td>
<td>9.00</td>
<td>10.00</td>
<td>9.00</td>
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<td>6.00</td>
<td>10.00</td>
</tr>
<tr>
<td>FID5: CBD</td>
<td>Transit-Oriented District</td>
<td>9.00</td>
<td>11.00</td>
<td>10.00</td>
<td>9.00</td>
<td>11.00</td>
<td>10.00</td>
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<td>6.00</td>
<td>6.00</td>
<td>10.00</td>
</tr>
<tr>
<td>FID6: CBD</td>
<td>Mixed Residential District</td>
<td>11.00</td>
<td>11.00</td>
<td>10.00</td>
<td>9.00</td>
<td>11.00</td>
<td>10.00</td>
<td>12.00</td>
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<td>6.00</td>
<td>6.00</td>
<td>6.00</td>
<td>10.00</td>
</tr>
</tbody>
</table>

Overview of Methodology

1. Determine multi-modal districts and corridors
2. Apply corridor and district typologies – understand their function, typology (characteristics and layout) and how they relate to each other
   a. Placemaking corridor
   b. Thru corridor
   c. Connector corridor
   d. Local corridor
   e. District Node
3. Apply component zone guidelines
   a. Pedestrian Activity Zone
   b. Frontage Zone
   c. Pedestrian Way (sidewalk/path)
   d. Separation Zone (buffer)
   e. Bus Transit Way (bus lanes)
   f. Street Parking Zone (on-street parking)
   g. Bicycle Way (bike lanes)
   h. Vehicle Travel Way
9. Smart Mobility 2010: A Call to Action for the New Decade

by Caltrans (Feb 2010)

The Smart Mobility handbook represents an approach to integrating transportation and land use using the concept of location efficiency. It presents a methodology for understanding smart mobility within the context of location efficiency and identifies different place types throughout the state based on location efficiency potential. The place types create a distinct context for transportation investments and opportunities for mobility benefits. They are necessarily broad and should be applied at a general planning level of detail. Finer-grained analysis would show large areas characterized as one place type would actually consist of several subareas with characteristics of other place types.

The handbook provides multimodal performance measures for smart mobility, compares them to conventional Caltrans performance measures, and explains how the performance measures apply to different place types. This document has particular relevance to the Virginia statewide guidelines effort, as it represents an effort to classify areas within a state into different place types and may be helpful in defining multimodal districts for Virginia.

Location Efficiency: Community Design and Regional Accessibility

One of the six Smart Mobility Principles is Location Efficiency, which describes the fit between a specific physical environment and its transportation system and services. Location efficiency is defined by two elements: community design and regional accessibility. Community design consists of the characteristics of development use, form, and location that combine with the multimodal transportation system to support convenience, non-motorized travel, and efficient vehicle trips at the neighborhood and area scale. Regional accessibility describes similar characteristics at the regional, interstate and international scales.

Exhibit 6: Location Efficiency Factors and Smart Mobility Benefits

- Strong Community Design, Weak Regional Accessibility
  - Smart Mobility Benefits: Weak to Moderate
- Strong Community Design, Strong Regional Accessibility
  - Smart Mobility Benefits: Strong to Very Strong
- Weak Community Design, Weak Regional Accessibility
  - Smart Mobility Benefits: Weak to Moderate
- Strong Regional Accessibility, Weak Community Design
  - Smart Mobility Benefits: Weak to Moderate
Place Types across California:
The report identifies seven place types, some of which are further broken down into subcategories:

1. Urban Centers – further categorized into urban cores and urban centers
2. Close-in Compact Communities – further categorized into centers, corridors and neighborhoods
3. Compact Communities
4. Suburbs – further categorized into centers, corridors, dedicated use, and neighborhoods
5. Rural and Agricultural Lands – further categorized into rural towns and rural settlements & agricultural lands
6. Protected Lands
7. Special Use Areas

The handbook defines the levels of community design and regional accessibility for each place type, and shows how each place type fits in the location efficiency spectrum.
Key planning activities and priorities for transportation, development and conservation projects and programs are identified for each place type. A brief discussion on place type transitions over time identifies places as either anchored or transitional to increase location efficiency.
### Smart Mobility Performance Measures

The handbook defines 17 performance measures that relate back to the six Smart Mobility principles. These performance metrics are similar to conventional Caltrans metrics but redefined and reemphasized.

<table>
<thead>
<tr>
<th>Goal</th>
<th>Performance Measure</th>
<th>Recommended Metrics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Location Efficiency</td>
<td>Consistency with regional Sustainable Communities Strategy or Alternative Planning Strategy meeting regional performance standards. Comparison of alternatives based on acres of land consumed, and relative reductions in induced VMT through: compact land use strategies, demand management, and network management.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Percentage of trips within a corridor or region occurring by bus, rail or by other form of high-occupancy-vehicle.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Number of households within 30 minute transit ride of major employment center, within 20 minute auto ride of employment, within walking distance of schools. Weighted regional travel time and cost among trip producers and trip attractors.</td>
<td></td>
</tr>
<tr>
<td>Reliable Mobility</td>
<td>Travel times and costs by mode between representative origins and destinations, aggregated over corridor or region.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Day-to-day variability of travel times between representative origins and destinations by mode, aggregated over corridor or region.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mode-specific and blended LOS measures of pedestrian and bicycle accommodation and comfort, transit availability and reliability, and auto travel efficiency.</td>
<td></td>
</tr>
<tr>
<td>Health and Safety</td>
<td>Collision rate and severity by travel mode and facility, compared to statewide averages for each user group and facility type.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Conformance with guidance identifying suitable design elements and traffic speed with respect to mix of modes and adjoining land uses and area character.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Percentage of trips within a corridor or region occurring by walking or cycling.</td>
<td></td>
</tr>
<tr>
<td>Environmental Stewardship</td>
<td>VMT per capita by speed range relative to State and regional targets.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Quantities of criteria pollutants and GHGs.</td>
<td></td>
</tr>
<tr>
<td>Social Equity</td>
<td>Impact of investments on low-income, minority, disabled, youth and elderly populations relative to impacts on population as a whole.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Comparative travel times and costs by income groups and by minority and non-minority groups for work/school and other trips.</td>
<td></td>
</tr>
<tr>
<td>Robust Economy</td>
<td>Time lost to congestion by trips that are economically productive and/or sustaining of essential mobility, measured as vehicle hours of delay (VHD).</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Additional VMT that are associated with economic productivity and/or sustaining of essential mobility compared with system expansion cost and impact.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>VHD per capita, per lane mile, per private vehicle mile, per freight vehicle mile, per transit revenue mile, and in total.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Person miles and revenue per lane mile of road, per transit revenue mile and per dollar invested (from all public and private funding sources). Comparison of alternatives based on benefits per dollar invested relative to: a) system user benefits (time and expense), and b) other Smart Mobility Performance Measures.</td>
<td></td>
</tr>
</tbody>
</table>

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2. Typical resources: Caltrans DD64 Complete Streets guidelines, ITE practices on Context Sensitive Solutions.
3. Targets set by California Air Resources Board under SB375. Rates of GHG emissions and fuel consumption both vary by speed range or “hr.”
Specific planning and projected development processes into which the Smart Mobility performance measure can be implemented are identified. The handbook provides examples of agencies across the nation who have successfully implemented these metrics and outlines the guidelines, methods, and tools and data needs for each performance measure.

The handbook ties together the concepts of performance metrics and place types by specifying modal emphasis by facility type for each place type. This prioritizes performance measures based on facility type and place type. Some performance measures should receive high importance regardless of facility or place type (e.g. modal collision rates, speed suitability and travel time consistency). Others vary. For example, network performance optimization and speed management rank higher for arterials and urban freeways than for rural freeways and highways.

**Exhibit 15: Framework for Integrating Place Type and Facility Type in Weighing Modal Priorities in Planning and Project Evaluation Criteria**

<table>
<thead>
<tr>
<th>Place Type</th>
<th>Freeway</th>
<th>Expressway</th>
<th>Arterial</th>
<th>Collector</th>
<th>Rural Hwy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urban Centers</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Urban Cores</td>
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<td>◼</td>
<td>◼</td>
<td>-</td>
</tr>
<tr>
<td>Urban Centers</td>
<td>▲</td>
<td>◼</td>
<td>◼</td>
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<td>-</td>
</tr>
<tr>
<td>Close-in Compact Communities</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Centers</td>
<td>▲</td>
<td>◼</td>
<td>◼</td>
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<td>-</td>
</tr>
<tr>
<td>Corridors</td>
<td>▲</td>
<td>▲</td>
<td>◼</td>
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<td>-</td>
</tr>
<tr>
<td>Neighborhoods</td>
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<td>◼</td>
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<td>-</td>
</tr>
<tr>
<td>Compact Communities</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Centers</td>
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<td>◼</td>
<td>◼</td>
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</tr>
<tr>
<td>Corridors</td>
<td>▲</td>
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<td>◼</td>
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<tr>
<td>Dedicated Use Areas</td>
<td>▲</td>
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<td>◼</td>
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<td>▲</td>
</tr>
<tr>
<td>Neighborhoods</td>
<td>▲</td>
<td>◼</td>
<td>◼</td>
<td>◼</td>
<td></td>
</tr>
<tr>
<td>Suburban Communities</td>
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<td>Centers</td>
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<tr>
<td>Corridors</td>
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<tr>
<td>Dedicated Use Areas</td>
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<tr>
<td>Neighborhoods</td>
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<td>◼</td>
<td>◼</td>
<td>◼</td>
<td></td>
</tr>
<tr>
<td>Rural</td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>Towns</td>
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<td>◼</td>
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<td>Settlements/Ag</td>
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<td>◼</td>
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<td>Special Use Areas</td>
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<td>▲</td>
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</tr>
</tbody>
</table>

The 1996 Transportation Master Plan identified 10 multimodal corridors within the City of Boulder. The 10 corridors were divided and prioritized into 42 segments. The Current Funding program specifies 11 segments that can be constructed with allocated funds. Additional funds identified in the Action plan would allow 21 of these corridor segments to be implemented, while the Vision program builds out all 42 segments.

The City’s website provides several general improvements for each mode that will be implemented in the 10 corridors:

**Roadway**
- Roadway reconstruction to reduce long-term maintenance liabilities;
- Improved operational and traffic flow through intersection enhancements focusing on system bottlenecks;
- Roadway improvements which support multi-occupant vehicle use;
- Roadway-related (functional efficiency/safety) improvements in priority corridors; and
- Signal coordination optimization based on current traffic flow patterns.

**Pedestrian**
- Complete segments of missing sidewalks to provide direct and continuous connections between destinations and to transit;
- Continue adding enhanced pedestrian crossings at strategic locations; and
- Continue installation of pedestrian signals and crossing count-down heads.

**Bicycle**
- Complete missing bicycle trails and bicycle lanes to provide direct and continuous connections;
- Construct needed underpasses at high volume locations to provide safe connections; and
- Provide bicycle route signage.

**Transit**
- Deploy the high-frequency Community Transit Network (CTN);
- Construct enhancements at key high-frequency transit stops to include, at a minimum, transit signs and pavement platforms. At higher demand transit stops, shelters, benches and trash receptacles will be provided; and
- Operational system efficiency improvements, such as bus bypass lanes, bus signal prioritization and other improvements to increase the efficiency of the CTN.
## Multimodal Corridors

<table>
<thead>
<tr>
<th>Current Funding</th>
<th>Action Plan</th>
<th>Vision</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Multimodal Corridor Investments</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><img src="image1" alt="11 of 42 Corridor Segments" /></td>
<td><img src="image2" alt="21 of 42 Corridor Segments" /></td>
<td><img src="image3" alt="42 of 42 Corridor Segments" /></td>
</tr>
<tr>
<td>Shaded areas represent corridor investments.</td>
<td>Shaded areas represent corridor investments.</td>
<td>Shaded areas represent corridor investments.</td>
</tr>
</tbody>
</table>

### Transit
- **Maintain current CTN**
  - HOP
  - SKIP
  - JUMP
  - DASH
- **Maintain CTN plus Leap and Orbit**
- **Grid-based City and County CTN**

### Roadway
- **Roadway**
  - Reconstruction to reduce long-term maintenance liabilities
  - Improved operational and traffic flow through intersection enhancements focusing on system "bottlenecks"
  - Provide roadway improvements which support multi-occupant vehicle use
  - Implement roadway-related (functional, efficiency/safety) improvements in priority corridors

### Pedestrian
- Sidewalks, pedestrian crossings, pedestrian signals improvements

### Bicycle
- Trails, lanes, underpasses

### Transit
- **Increase funding to 25% of total Special Transit costs**
- **Increase Special Transit funding in response to growing aged population**
- **Web-based real-time transit information**
- **Web-based real-time transit information for all buses traveling within the City of Boulder**

### Corridor Improvements

11. Transit Service Design Guidelines by Virginia Department of Rail and Public Transportation (November 2008)

The Transit Service Design Guidelines were compiled by the Virginia Department of Rail and Public Transportation (DRPT) in 2008 in an effort to provide communities with guidance on starting new transit service. The guidelines are intended to help local governments, transit providers and citizens better understand the types of transit systems and services that are available to meet community and regional transportation needs, as well as helping DRPT in making recommendations to the Commonwealth Transportation Board for transit investment.

The guidelines are an excellent primer for anyone interested in basic information about how to plan for transit and key considerations for matching local needs with solutions. Some of the basic considerations include: local land use, trip patterns, affordability, economic development goals, environmental factors and many others. It describes various planning studies that a community might undertake to determine transportation needs, and describes what steps a community might take depending on their level of experience with transit. The document also outlines various other cost-effective, transportation demand management (TDM) options to consider before investing in transit. Examples include: Alternative Cash Incentive Program, Carpool and Vanpool Matching, Car Sharing and Bike Sharing Programs, Flexible Schedules, Guaranteed Ride Home, Parking Cash Out Programs, and Telecommuting.

Two sections of the document are particularly relevant for this study. The first is the section on land use considerations, which outlines transit supportive development levels by transit category. While adopted from FTA and ITE, these two tables can help provide a framework for understanding Multimodal Districts and TOD placetypes statewide.

### Development Levels Supportive of Rail

<table>
<thead>
<tr>
<th>Measure</th>
<th>Development Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population densities (persons per square mile)</td>
<td>6,667 - 15,000</td>
</tr>
<tr>
<td>Employment Served</td>
<td>125,000 - 250,000</td>
</tr>
<tr>
<td>Central Business District commercial floor to area ratio (FAR)</td>
<td>6.0 – 10.0</td>
</tr>
<tr>
<td>Other commercial floor to area ratio (FAR)</td>
<td>1.0 - 2.5</td>
</tr>
<tr>
<td>Residential dwelling units per acre</td>
<td>10 - 25</td>
</tr>
</tbody>
</table>

Sources: Federal Transit Administration: Guidelines and Standards for Assessing Transit Supportive Land Use – May 2004

### Development Levels Supportive of Fixed Route Bus

<table>
<thead>
<tr>
<th>Measure</th>
<th>Development Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population densities (persons per square mile)</td>
<td>2,500 - 4,000</td>
</tr>
<tr>
<td>Employment Served (per acre)</td>
<td>4 - 5</td>
</tr>
<tr>
<td>Commercial floor to area ratio (FAR)</td>
<td>0.35 – 1.0</td>
</tr>
<tr>
<td>Residential dwelling units per acre</td>
<td>4 - 5</td>
</tr>
</tbody>
</table>

Transit Service Guidelines

The second item of interest is the section on Transit Service Guidelines. This section of the guidelines provides an overview of specific modes within each of the four transit mode categories: Rail, Fixed Route Bus, Demand Response Bus, and Ferry. Individual modes range from small vans serving low-density rural areas to high capacity rail systems providing quick, convenient service for commuters traveling in high-density urban areas. For each mode, a brief description is provided, along with typical physical and operating characteristics of the system such as station spacing and frequency of the service. Typical physical and operating characteristics of each mode are presented in ranges. Information also is provided about how the service might be operated, and over what periods of time and days of the week. For the purposes of this study, this type of information will help to inform the composition of a multimodal district, and can further be linked to different land use characteristics associated with TOD.

Streetcar

New Orleans Regional Transit Authority

The Portland Streetcar

Description
Streetcars are rail transit vehicles designed for local transportation, powered by electricity received from an overhead wire. Streetcar systems are in operation in such locations as New Orleans, Portland, Oregon, and Seattle. Many other localities are considering streetcar systems to support downtown circulation needs.

Several others cities, such as Memphis, Little Rock, Tampa, and Kenosha, Wisconsin operate heritage streetcars, which combine local transportation with historical nostalgia. These systems are used frequently by tourists and visitors to travel to downtown areas.

Typical Characteristics
- **Capital cost**: $10 - $30 million per mile
- **Operating cost**: $.50 - $1.50 per passenger mile
- **Service distance**: 2 - 4 miles
- **Streetcar stop spacing**: 0.10 - 0.25 miles
- **Speeds (avg/max)**: 8 - 12 mph/45 mph
- **Service frequency**: 8 - 15 minutes (peak)
- **Service frequency**: 20 - 60 minutes (off peak)
- **Span of service**: 7 days per week
  - 5:00 a.m. to 1:00 a.m. on weekdays
  - 6:00 a.m. to 1:00 a.m. on weekends
- **Streetcar capacity**: 30 - 50 seated (plus standees)
- **Typical loads**: 150 percent in peak
- **Maximum capacity**: 565 passengers per hour (75 passengers per car/ every 12 minutes)
The Station Site and Access Planning Manual provides station area and facility design guidelines to maximize accessibility for all Metrorail passengers. It is intended to address physical design and operation issues that arise during the planning and design phases of development projects within transit station areas. Key transit access principles, approaches and parameters are provided to clarify transit access needs while serving as a flexible guide to allow designers to find the best solution for any situation.

The document acknowledges that all modes of access to a station cannot be given equal priority. As such, the station site facility design guidelines prioritize facilities based on mode, as illustrated in the access hierarchy, with pedestrian and sensory-impaired passengers having the highest importance, followed by bicycles, transit, Kiss & Ride and Park & Ride.

Basic planning considerations tell designers what facilities should be provided for each access mode. Dimensional guidelines specify standards for these facilities and are accompanied by design illustrations.

Pedestrian facilities have the highest importance for access. Conflicts between pedestrians and other modes should be minimized through the provision of direct pathways designed for maximum pedestrian safety. Pedestrian design considerations include connectivity, walkway surfaces, elevation changes and intersection treatments. Bicycle access is the second highest priority, with a focus on enhancing connectivity and providing safe and convenient parking and storage. Transit has the highest priority of all motorized modes. Design considerations for transit include location and connection of bus stop relative to Metrorail station entrance and exit, transit priority improvements, walkway and stop canopies, and bus bay layout and location. Kiss & Ride and Park & Ride facility design considerations include pick-up and drop-off zones, parking layout, and revenue control.
Directional guidance for the joint development of facilities illustrates how the station can best fit within the surrounding development and existing transportation network. Planners, developers and community members working together will create vibrant memorable places. Guidance in the Station Site and Access Manual includes procedural strategies to encourage coordination between planners and developers so both can effectively contribute to and benefit from transit station and create a transit-oriented community.

The design guidelines can be used by developers during joint development projects and should help clarify design expectations and ease coordination between developers, site designers, and transit planners in the review and approval process. Design considerations for joint development projects include: setbacks between transit alignments and buildings; location of bus stop transfer facilities; maintenance of pedestrian connectivity and provisions for pedestrian safety, street patterns, parking considerations, landscaping amenities, wayfinding signage and security features. Place making initiatives, like provision of open space and strategic grouping of public facilities, should be employed to allow the transit facility to serve as the catalyst for an activity center.
This document will help in developing prototypical station area designs, as it acknowledges the conflicts of access between modes and offers guidance for establishing priorities.

Most relevant to this study effort is the definition of different station area types. Stations located in a dense downtown area will have different characteristics than stations located at the end of the line or in a low-density area. Although not a primary focus of the document, the Station Area Access Manual defines three different area types. This classification serves as a guide to understanding which transit site facilities may be expected in a particular geographical area.

| Core Stations: These are stations located in a high density, downtown areas, such as Washington DC, Rosslyn, and Crystal City, where other Metrorail stations serve the adjacent area. These stations are accessible primarily by walking, bicycling, and bus. | Mid-Line Stations: Mid-line stations are typically located in areas with low to medium density and are usually accessed by Park & Ride, Kiss & Ride, bus, bicycling, and walking modes. Mid-line stations are located in areas where other Metrorail stations are further away and serves a greater area, thus many customers must rely on the non-walking mode to access the station. | Terminus Stations: Terminus stations are located at the end of Metrorail lines. Typically, terminus stations are accessed by Park & Ride, bus, Kiss & Ride, then walking. However, comprehensive regional planning that improves pedestrian and bicycle access to the station could increase the walking and bicycle mode. Terminus stations typically serve a wide geographical area that normally extends beyond the greater Washington area, creating a high demand for Park & Ride mode. |
13. Transforming Tysons: Vision and Area Wide Recommendations, Tysons Land Use Task Force, by Fairfax County (September 2008)

In 2005, the Fairfax County Board of Supervisors created the 36-member Tysons Land Use Task Force to gather community input and recommend a land use and transportation plan that would transform four future Metrorail stations in Tysons Corner proposed as part of the extension to Dulles Airport from suburban office parks into livable urban centers. Three years later, the task force presented its recommendations for an innovative vision and area plan for land use, transportation, environmental stewardship, public facilities and urban design.

Tysons is divided into eight districts, four surrounding the future rail stations and four creating a transition to adjacent communities. Land use designations within each district are articulately described and carefully selected to achieve a unique sense of place and logical layout of destinations and paths of travel.

The vision for Tysons consists of six guiding principles:

1. Create a people-focused urban setting which significantly increases residential opportunities;
2. Redesign the transportation network with a strong focus on transit, walking, and bikes;
3. Place a strong emphasis on the environment;
4. Develop a vital civic infrastructure of the arts, culture, recreation and the exchange of ideas;
5. Sustain and enhance the contributions of Tysons as the county’s employment center and economic engine; and
6. Create an authority for implementation that provides the flexibility, accountability, consensus and resources necessary to achieve the vision.

The area-wide land use and transportation plan emphasizes the working together of multiple elements to create a center with a sense of place. The land use designations and transportation recommendations are reinforced with connections, amenities, strategically located parking and a focus on a people-scaled environment.

The Tysons plan is an excellent example of a specific area plan that approaches the different aspects of transit-oriented planning and design from a holistic perspective. Each element (urban design, land use, transportation, etc) is viewed through a unique lens, but focuses on overarching guiding principles. The urban design designations are different from the land use designations and intensity designations, but all come together to achieve a unified pattern for intensity in the center with decreasing densities and a well thought-out circulation plan. The Tysons plan demonstrates how an individual locality might apply statewide recommendations at a smaller scale.
Land Use

The land use component stresses transit-oriented development, a balance of jobs and housing, defined neighborhoods, protection of the edges, and well-integrated community benefits. Over 95 percent of all development will be located within a half-mile of the rail stations or within 600 feet of the circulator, with transitions between the higher densities near the rail stations and the lower densities of the adjacent communities.

In addition to the traditional land use map with categories like residential mixed use and office mixed use, the area is also subdivided into intensity categories.
This section on intensity may be of particular use to the Virginia statewide effort as it contains specific definitions and standards. The intensity categories are based on distance from transit (Metro and circulator). Each category has a range of allowable densities, expressed by a minimum and maximum FAR to allow the flexibility to respond to market changes while ensuring all development will be consistent with the vision and support the transit investments. Areas closest to the Metro stations have the highest densities, and densities decrease incrementally as you move away from the Metro stations.

The tiered density approach is coupled with requirements for a mix of uses and infrastructure to guarantee other livability factors are in place. Land use guidelines include considerations for affordable and workforce housing, parcel consolidation and coordinated development plans, and existing uses and buildings.

<table>
<thead>
<tr>
<th>TABLE 1: Maximum Allowable Floor Area Ratios</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Distance Category</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>0 – 1/8 mile from Metro</td>
</tr>
<tr>
<td>1/8 – 1/4 mile from Metro</td>
</tr>
<tr>
<td>1/4 – 1/3 mile from Metro</td>
</tr>
<tr>
<td>1/3 – 1/2 mile from Metro</td>
</tr>
<tr>
<td>0 – 400 feet from circulator</td>
</tr>
<tr>
<td>400 – 600 feet from circulator</td>
</tr>
</tbody>
</table>

Note: In the case of residential FAR, the bonus and offset will be each applied to the allowable maximum before bonuses; they will not be compounded. For mixed-use development, the allowable intensity will blend the residential and non-residential FARs proportionally.
**Transportation**

The transportation recommendations focus on improved mobility within the area for greater mode choice, a system of circulators, regional connectivity and new urban standards for all streets and roads. A functionally classified street map is coupled with illustrated typical sections to demonstrate the versatility of the street system in allowing different types of trips to use different streets. To ensure Tysons residents can get around without a car, a system of three circulator routes will extend the reach of the Metrorail system and connect the districts. Bicycle and pedestrian movement is integrated in the design of the street network. Transportation demand management and parking management strategies are also discussed.
**Urban Design**

The urban design recommendations consist of general Urban Design Principles and more specific Urban Design Guidelines. The Tysons Land Use Task Force consolidated a ‘constellation’ of Urban Design Principles to provide the framework for transitioning to the future. The principles address regional identity, identifiable centers and edges, vibrant streets and walkable block pattern, quality public realm and natural features, mix of uses, balanced growth and community benefits, and edge areas.

The Urban Design Guidelines provide more detail and direction on how to implement the principles and create the desired urban form. The guidelines organize the urban fabric into four elements: **blocks**, **streets**, **pedestrian zones**, and **buildings**. Several general guidelines for each of the four elements are applicable throughout the Tysons area regardless of district. More detailed guidelines are specific to three distinct character zones:

1. Station Core Zone
2. Circulator Zone
3. Transition Zone

These detailed design guidelines include specifications for block size, parking, build-to lines, setbacks, bulk, massing, building articulation, fenestration, transparency, landmarks, gateways and public art. The plan also contains sections on environmental stewardship and public facilities, incorporating aspects of sustainability, stormwater management, green architecture, parks and open space, and community services.
Implementation Strategy
The area-wide plan is accommodated by an implementation strategy that establishes priorities and responsibilities, recognizing the need for evolution to achieve successful implementation. More detailed planning will be required, including preparing district plans, identifying the circulator alignment, creating a coordinated parks and open space network, and crafting an environmental stewardship strategy. Other essential elements include establishing an implementing authority, a funding strategy, public-private partnerships, a regulatory framework, and a phasing plan. National examples of cities that have successfully utilized innovative implementation strategies are provided, including the Midtown Alliance in Atlanta and the Downtown Denver Partnership.
14. Street Design Guidelines, by City of Roanoke, Virginia (July 2007)

The City of Roanoke created and adopted its Street Design Guidelines to provide viable transportation options, ensure its city streets serve all modes of transportation, enhance pedestrian and bicycle safety and convenience, encourage active living, reduce congestion and improve air quality.

These guidelines provide a local example of classifying streets based on function and character. The statewide Virginia guidelines could use the approach of the Roanoke Street Design Guidelines as a basis for the multimodal corridors element. The City of Roanoke classifies its street network into three categories by function and character: arterials, collectors, and locals.

The City also organizes its land area into eight character districts that describe the general building style, development form and land purpose.

1. Downtown
2. Village Center
3. Recreation/Open Space
4. Traditional Residential Neighborhood
5. Suburban Residential Neighborhood
6. Local Commercial
7. Regional Commercial
8. Industrial

The Street Design Guidelines provide corridor recommendations for each street type within each character district. These corridor guidelines organize the street cross-section in to seven zones as they relate to automobile accommodations, bicycle accommodations, pedestrian accommodations, transit accommodations, trees, signs, and lighting. Street cross-section illustrations of the street types for each character district demonstrate the ideal minimum width for each zone. Preferred and retrofit options are presented, acknowledging that the ideal cross-section may not be attainable in all instances because of right-of-way constraints.
General streetscape guidelines are provided for elements like benches and bicycle parking that are applicable to all areas with the city regardless of character district.
15. Arlington County’s Transit Corridor Growth Strategy

Since the 1960s, Arlington County has successfully concentrated high-density development within Metro corridors and preserved lower-density residential areas throughout the County using a variety of planning and policy documents, regulatory tools and ordinances. The General Land Use Plan describes broad goals and establishes policies that focus on areas within Metro Station Areas and Metro Corridors. It also establishes zoning mechanisms to achieve these goals. Policy plans and land use plans for the Rosslyn-Ballston and Jefferson-Davis Metro Corridors provide the foundation for a unified long-range planning approach. Sector plans for the individual station areas delve into the details of urban design, zoning, transportation, and market trends, distinguishing the unique character of each station area. Arlington County continually tracks development statistics within the Metro corridors dating back to 1960 to quantify its success.

General Land Use Plan

The General Land Use Plan’s goals include concentrating high-density development, promoting mixed-use development, and increasing the supply and variety of housing within the Metro corridors. It concentrates the highest density uses within walking distance of Metro stations; tapers densities, heights and uses down to single-family residential neighborhoods; and provides for a mix of office, hotel, retail and residential development. The Plan establishes regulatory mechanisms, namely special coordinated mixed-use zoning districts which allow FARs that exceed general zoning designations and special residential zoning districts which promote tapering of heights between higher-density commercial development and lower-density residential neighborhoods.

Each station area serves a unique function within the corridor. Rosslyn is a first class office and business center. Courthouse is the County’s government center. Clarendon is planned as an "urban village." Virginia Square contains a concentration of residential, cultural and educational facilities. Ballston is developing as Arlington’s "new downtown."

Crystal City Sector Plan

This sector plan provides the policy framework, master plan, and implementation steps for the Crystal City planning area, a 260-acre (0.4 sq. mi.) area within the 361-acre (0.6 sq. mi.) Crystal City Metro Station Area, as defined by the General Land Use Plan. It includes a discussion on the impact of regional growth, including identification of activity centers and their dispersion along major transportation corridors. It is an example of high density mixed use neighborhood and an economic engine with high-rises approaching full build-out of existing plans.

The planning area for station has an oblong shape. It is 1.3 miles from north to south and varies in length from east to west with a maximum width of 0.5 miles. It excludes the areas of low-density residential. Within the planning area, the plan defines neighborhoods and districts based on use characteristics and identifies destinations. It also distinguishes the ways in which the transportation infrastructure influences the area, local and collector streets connecting places within the area, and large arterials acting as barriers or edges to the districts.

East Falls Church Area Plan

The East Falls Church Area represents an example of a commuter station area with park-and-ride and kiss-and-ride facilities. It is less dense than the other Metro station areas within Arlington County. The East Falls Church Area Plan provides a policy framework, concept plan, design guidelines, and implementation actions.
The study area includes the commercial development and multi-family housing along I-66 and some of the single-family housing. Much of the existing single-family housing is not included, even though it is within a quarter-mile of the Metro station, in an effort to preserve it. The plan introduces the Neighborhood Center concept, a collection of three low- to medium-scale mixed use development nodes, each with its own specific character and role. These are essentially different mini-districts working together to create a cohesive whole.

**Clarendon Sector Plan**

Clarendon represents a future "urban village" with public spaces, accessibility, connectivity and a rich mix of uses to achieve a sense of place and uniqueness. The sector plan includes policies on urban form, transportation, land use, historic preservation and other topics. It includes urban design guidelines and a matrix of implementation recommendations. The station area boundary is approximately a quarter-mile radius within the Metro Station areas.
D. Virginia’s Statewide Integrated Multimodal Planning Framework

The Virginia Department of Transportation (VDOT) has taken numerous steps in recent years to better accommodate multiple modes in its transportation planning and design process. This section reviews the various policies that support integrated, multimodal transportation in Virginia including:

- Policy for Integrating Bicycle and Pedestrian Accommodations
- Context Sensitive Solutions Policy
- Urban Development Areas
- Secondary Street Acceptance Requirements
- Chapter 527 Traffic Impact Analysis Regulations
- Access Management Regulations and Standards
- VTrans2035 and the Virginia Surface Transportation Plan

1. Policy for Integrating Bicycle and Pedestrian Accommodations

In March 2004, the Commonwealth Transportation Board (CTB) adopted the “Policy for Integrating Bicycle and Pedestrian Accommodations.” The policy identifies bicycling and walking as fundamental travel modes and states that all transportation projects will start with the assumption that accommodation will be provided. The intent of the policy is to integrate bicycle and pedestrian accommodations into all of VDOT’s procedures and projects, therefore increasing multimodal options for Virginians. Following the adoption of the policy, a VDOT interdisciplinary team was formed to promote the funding, development, operation, and maintenance of bicycle and pedestrian accommodations. The team developed updated procedures and best practices for VDOT including guidelines for coordinating with localities, planning level cost estimates, and updated construction and maintenance scoping forms to ensure inclusion of bicycle and pedestrian accommodations.

The procedures identified by the team include:

- Guidelines for coordinating with localities that encourage the development and use of bicycle and pedestrian plans as the primary resource for discussions regarding accommodations
- Spending two percent of the paving budget in each VDOT Construction District to provide paved shoulders
- Clarification and guidance for when the Policy’s six exceptions can be used, those exceptions are: (1) absence of need for accommodations, (2) environmental or social impacts that outweigh the need for accommodations, (3) evidence that safety would be compromised, (4) costs excessively disproportionate to the need, (5) project purpose and scope that do not facilitate the provision of accommodations, and (6) locations where bicycle and pedestrian travel is prohibited by state or federal law
- A decision process tree to evaluate and document how bicycle and pedestrian accommodations are provided during the scoping of VDOT managed projects
- Revision and updates to numerous design and maintenance forms and instructional memos

Note: In May 2007, VDOT issued a Department Policy Memorandum (DPM) on Implementation of the CTB Policy for Integrating Bicycle and Pedestrian Accommodations. This DPM provides definitions, procedures, and exceptions and identifies reference materials to clarify and supplement the Policy, to the extent necessary for operational effectiveness and compliance.
VDOT has embarked on a three-tiered approach to further integrate the policy in daily VDOT business practices, which includes:

- Development of a Bicycle Policy Plan
- Development of a Pedestrian Policy Plan
- Implementation Plan for both the Bicycle and Pedestrian Policy Plans

VDOT is currently developing a Statewide Bicycle Policy Plan that provides a framework to implement the bicycle portion of that policy and establishes a vision for the future of bicycling in the Commonwealth. It builds upon past VDOT initiatives to ensure that bicycle facilities are an integral component of the transportation system. It provides goals and objectives, recommends actions, and sets a platform for the development of a series of performance measures that will track progress over time. The Statewide Bicycle Policy Plan specifically addresses the following areas:

- The Plan provides strategies for enhancing the implementation of the Policy for Integrating Bicycle and Pedestrian Accommodations approved by the CTB in 2004.
- It establishes policies to guide the planning and design of bicycle facilities.
- It identifies opportunities for enhancing coordination between and within the various levels of VDOT, as well as with stakeholders outside of the organization.
- It recommends training programs needed for professionals who are responsible for planning and designing bicycle facilities.
- It sets forward benchmarks for tracking the implementation over time.

The Bicycle Policy Plan does not identify specific bicycle and pedestrian projects, but provides planning level guidance and policies that address the need for providing access, connectivity, and integration across individual modes to make bicycling a safe and feasible commuting and recreational alternative.

2. **Context Sensitive Solutions Policy**

VDOT’s Context Sensitive Solutions (CSS) policy promotes transportation facilities that provide transportation safety and mobility, while also fitting the physical setting and reflecting concerns regarding scenic, aesthetic, historic, and environmental resources. The CSS policy seeks a realistic and practical balance between transportation goals and community values and needs. It encourages enhanced stakeholder engagement and consensus on clearly defined project goals before proceeding to the design phase of a project. The CSS policy requires VDOT to consider that motorists, pedestrians, bicyclists, and public transit vehicles jointly use transportation systems for both transportation and recreational purposes.

3. **Urban Development Areas**

In 2007, the General Assembly added Section 15.2-2223.1 to the Code of Virginia requiring high growth localities to designate Urban Development Areas (UDA) in their comprehensive plans by July 1, 2011 (counties) and July 1, 2012 (cities and towns). UDAs are intended to improve the coordination between transportation and land use. They include locations with reasonably compact existing development that can accommodate 10 to 20 years of projected growth.

The comprehensive plan must provide for commercial and residential densities within urban development areas that are appropriate for reasonably compact development at a density of at least four residential units per gross acre and a minimum floor area ratio of 0.4 per gross acre for commercial
development. These minimum requirements fit very well with necessary development levels to support fixed route bus and going beyond the minimum requirements can achieve a level that supports rail.

The amendment to the Code also requires comprehensive plans to incorporate principles of new urbanism and traditional neighborhood development, a development strategy that encourages smart managed growth. The legislation highlights a number of key principles which may include but are not limited to: pedestrian-friendly road design, interconnection of new local streets with existing local streets and roads, connectivity of road and pedestrian networks, preservation of natural areas, satisfaction of requirements for stormwater management, mixed-use neighborhoods, including mixed housing types, reduction of front and side yard building setbacks, and reduction of subdivision street widths and turning radii at subdivision street intersections. Encouraging well-designed development and growth in appropriate areas can help reduce trip lengths, encourage trips by other modes, foster more sustainable development patterns, and manage costs in the future.

4. Secondary Streets Acceptance Requirements

The Commonwealth Transportation Board approved the Secondary Street Acceptance Requirements (SSAR) in February 2009. The SSARs establish requirements that newly constructed streets must meet in order to be accepted into the secondary system of state highways and as a result to qualify for ongoing VDOT maintenance.

The most significant aspect of the revised regulation is that it introduces a change in public policy regarding the design and function a street must meet in order to be added to the state system.

The Commonwealth agrees to maintain streets built by developers and accepted by counties to the benefit and marketability of their developments. In exchange, the developer must build streets that connect with the surrounding transportation network in a manner that enhances the capacity of the overall transportation network and accommodates pedestrians.

The following describes the policies within the SSAR which are new to Virginia and most relate to the context of this research:

Area Types

- The division of the state into three categories based on long-term local, regional and federal planning boundaries.
- These area types are Compact, Suburban, and Rural.
- The importance of area types within the SSAR is that a parcel’s area type will determine the connectivity and may impact pedestrian accommodation requirements which need to be met.
Connectivity Requirements

- Standards to ensure multiple connections with existing streets and adjacent properties.
- The “connectivity index” requirement is based upon a development’s area type.
- The connectivity index can be found by dividing the development’s street segments by its intersections (street segments/intersections). The SSAR Guidance Document has an extensive section on these calculations and definitions.
- Compact and Suburban area types must meet a 1.6 and a 1.4 index, respectively, while developments in the Rural area type are not required to meet an index amount.
- All newly built developments, regardless of area type, must have multiple transportation connections in different directions. This can be accomplished with connections to existing roads in the state system or “stub outs” constructed to the property line for a future connection.

Pedestrian and Bicycle Accommodations

- Sidewalk, trail, and path requirements are based upon density, proximity to public schools, and the functional classification of streets.
- Pedestrian accommodations are required on both sides of streets for developments with a median lot size of one half acre or less, a floor area ratio of 0.4 or greater, and along collector and arterial roads with three or more lanes.
- Accommodations must be provided on one side of the street for developments with median lot sizes between one half acre and two acres, developments within one half centerline mile of a public school in Compact and Suburban area types, and along collector and arterial roads with less than three lanes.
- If a development can be categorized into both groups requiring sidewalks on both and one side of a street, the higher requirement (pedestrian accommodations on both sides of the street) shall apply.
- Context sensitive street design – Revised street design requirements to provide initial design that will serve as built-in traffic calming and help ensure appropriate vehicular speeds. The SSAR also offers increased flexibility to use low impact development techniques to help reduce storm water runoff.
New development proposals initially submitted to counties and VDOT after June 30, 2009, must comply with the requirements of the SSAR.

5. Chapter 527 Traffic Impact Analysis Regulations

In 2006, the Code of Virginia was amended to add §15.2-222.1, which establishes procedures by which localities are directed to submit to VDOT for review and comment a traffic impact analysis for development proposals that would significantly impact the state transportation system. The goals of the amendment are to improve coordination between land use and transportation planning across Virginia by providing consistent information regarding traffic impacts of proposed land-use decisions to local decision-makers and citizens; and ensuring traffic impacts, both local and regional, are considered when land use decisions are made.

The requirement for localities to submit development proposals for VDOT to review through a traffic impact analysis is triggered at three key stages of land use: comprehensive plans and amendments, rezonings and site plans. At each of these key stages, VDOT has a fixed timeframe to review and comment on the traffic impact of the proposed land use change. The information and comments provided back to localities by VDOT is advisory since land use decisions remain a local prerogative.

The objectives of VDOT’s traffic impact analysis include the following:

- Present recommendations for potential improvements or changes that may mitigate traffic impacts of proposed development
- Identify impacts to the existing transportation network associated with vehicle trips generated by the proposed development
- Identify potential impacts to bicycle and pedestrian facilities as well as to transit accommodations
- Determine need for signal additions or modifications and other traffic engineering features

The Commonwealth has formalized this process through regulations, known as Chapter 527. In 2010, the Chapter 527 regulations were amended to offer local governments the option of conducting a single traffic analysis at the comprehensive plan stage of the development process for all parcels that are part of a small area plan for an urban development area or for a transit oriented development. These amendments will reduce the number of traffic impact analyses required for developments located within small area plan areas in an effort to realize the benefits of compact development, which are not always quantified when each proposed developments are considered individually.

Furthermore, the amendments require VDOT to approve a trip generation methodology that accurately determines the traffic impacts of urban developments. VDOT will need to adopt by July 1, 2011 at least one non-Institute of Transportation Engineers methodology or alternative trip/internal capture/modal split rate for determining the trip generation of development proposals within small area plans. The approved methodology will need to recognize the reduced vehicle trip generation of mixed-use, compact development patterns and transportation demand management measures.

Finally, the amendments will ensure that the applicable provisions of the Secondary Street Acceptance Requirements and the Access Management Regulations: Principal Arterials (24 VAC 30-72) and Access Management Regulations: Minor Arterials, Collectors, and Local Streets (24 VAC 30-73) are included in the traffic impact analyses.
6. **Access Management Regulations and Standards**

In 2007, the General Assembly approved legislation directing VDOT to develop access management regulations that would balance the right of property owners to reasonable access to the highway with the right of users of the roads to mobility, safety, and efficient expenditure of public funds. Regulations and standards address:

- Spacing entrances, intersections, median openings, and traffic signals;
- Locating entrances a safe distance from intersection turning movements and from interchange ramps;
- Providing vehicular, and where appropriate, pedestrian circulation between adjoining properties; and
- Sharing highway entrances.

The Access Management Regulations took effect on July 1, 2008 for Principal Arterials (24 VAC 30-72) and on October 14, 2009 for Minor Arterials, Collectors and Local Streets (24 VAC 30-73). Both Access Management Regulation documents require compliance with the CTB’s Policy for Integrating Bicycle and Pedestrian Accommodations, and require entrance design to accommodate transit users of the adjacent highways to the extent possible.

These documents require entrance and intersection spacing to comply with standards in Appendix F of the VDOT Road Design Manual. The spacing standards are based on functional classification (urban vs. rural and arterial vs. collector), the speed limit, and type of entrance. Exceptions to the spacing standards within the Road Design Manual include developments within a designated UDA or an area that the local comprehensive plan designates for higher development that incorporates principles of new urbanism and traditional neighborhood development (including pedestrian-friendly road design and connectivity of road and pedestrian networks). As a condition of a commercial entrance permit, applicants are required to provide pedestrian connections to the property line, unless the new access point is right-in-right-out only.

7. **VTrans2035 and the 2035 Virginia Surface Transportation Plan**

The Code of Virginia (§33.1-23.03) and federal regulations (23CFR450.214) require the CTB to develop a statewide multimodal long-range transportation plan every five years. VTrans2035 is Virginia’s long-range multimodal transportation plan and sets forth an overall vision with transportation policy goals, key investment priorities, and action items to set the foundation for future transportation in the Commonwealth.

VTrans2035 represents a uniquely integrated planning approach, as it was developed by the Office of Intermodal Planning and Investment and involved Virginia’s five statewide transportation agencies - Department of Aviation (DOAV), Department of Motor Vehicles (DMV), Department of Rail and Public Transportation (DRPT), Virginia Port Authority (VPA), and Department of Transportation (VDOT) - from start to finish. The guiding vision of the document is a multimodal transportation system that is safe, strategic and seamless. This vision directly relates to the purpose of the statewide multimodal and public space design guidelines, as it promotes the safe accommodation of and complete connected networks for all transportation modes.
VTrans2035 acknowledges the changing circumstances and growth pressures that are increasing the demand for transportation choices and the mobility needs of all residents. Investment priorities include all ranges of transit service and infrastructure, from high speed intercity rail between Washington DC, Richmond and Hampton Road and Metrorail expansion, to ensuring a state of good repair in Virginia’s local transit systems, to improving rural connectivity with transit and coordinated human services transportation. VTrans2035 provides high level policy guidance to integrate transportation and land use planning, and prioritizes increasing transit usage and encouraging supportive land uses.

The 2035 Virginia Surface Transportation Plan (VSTP) follows the policy guidance of VTrans2035 and identifies specific multimodal solutions for Virginia’s different regions, including public transportation strategies, rail investments and highway improvement projects. The 2035 VSTP represents a continuation of the integrated multimodal approach to statewide transportation planning in Virginia. Public transportation recommendations balance maintaining existing assets, expanding capacity, and investing in major capital projects like rapid transit service. The rail element of the VSTP explains the demand for increased passenger rail service. The statewide scope of the VSTP is too broad to include individual bicycle and pedestrian projects, but acknowledges the current regional trails available.

Several policy papers were prepared in conjunction with the VTrans2035 effort. The Transportation and Land Use: Challenges and Opportunities paper explains how the past growth patterns and expected growth influence the demand for transportation. It recognizes the need to accommodate future growth with compact development patterns that create proximity, especially for transit service. Analysis of the Fredericksburg area shows that allocating future growth into compact development areas results in better levels of service in major roads. The Regional Accessibility paper showcases the advantages of having proximity of activities, multimodal connectivity and transportation choices. It identifies the accessibility issues associated with varying levels of future growth rates, and regions within Virginia where those issues may arise. Recommendations from this paper include focusing growth in high density communities with a mix of activities and convenient connections for all transportation modes and expanding multimodal regional transportation networks.
E. Other Useful Web Resources

   


   


   

   

   
### Full Literature Review Summary Table

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<th>ORGANIZATION</th>
<th>DOCUMENT/ POLICY TITLE</th>
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<tbody>
<tr>
<td>Center for Transit Oriented Development</td>
<td>Station Area Planning: How to Make Great Transit Oriented Places</td>
<td>This guidebook focuses on TOD station areas and strategies to achieve TOD that maximizes ridership potential. It presents TOD place types and defines their characteristics, and provides station area planning principles.</td>
<td>Transit Oriented Development Policy and Strategy Guidance</td>
<td>Primarily focuses on local areas, but has applicability for region-wide scales.</td>
<td>Commuter Rail, Local Bus, Regional Bus, Light Rail, Streetcar, BRT, Heavy Rail</td>
<td>Place types are defined according to the intensity of surrounding development, the transit technology, and the characteristics of transit service.</td>
<td><a href="http://www.reconnectingamerica.org/public/show/tod202">http://www.reconnectingamerica.org/public/show/tod202</a></td>
<td>Published in February 2008.</td>
</tr>
<tr>
<td>Institute of Transportation Engineers and Congress for New Urbanism</td>
<td>Designing Walkable Urban Thoroughfares: A Context Sensitive Approach</td>
<td>This report is the industry standard for Context Sensitive Solutions and walkable thoroughfare design. Intended to facilitate the restoration of the complex multiple functions of urban streets. It provides planning and design guidance for urban roads, acknowledging their complexity and multiple functions. Application is generally limited to low-speed, urban arterials and collectors, streets that require tradeoffs between pedestrian and vehicle priority.</td>
<td>Multimodal Corridor Planning Strategies and Design Guidelines</td>
<td>All scales</td>
<td>Pedestrian, Bicycle, Roadway, Local Bus</td>
<td>Context zones describe the physical form and character of a place and are defined by multiple parameters, including land use, density and design features. Context zone is combined with functional classification and thoroughfare type.</td>
<td><a href="http://www.ite.org/emodules/scriptcontent/Orders/ProductDetail.cfm?pc=RP-016A-E">http://www.ite.org/emodules/scriptcontent/Orders/ProductDetail.cfm?pc=RP-016A-E</a></td>
<td>Adopted as an ITE Recommend ed Practice in March 2010.</td>
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<tr>
<td>Center for Transit Oriented Development</td>
<td>Mixed Income Housing Near Transit: Increasing Affordability with Location Efficiency</td>
<td>This best practice guidebook outlines 11 strategies on how to preserve and encourage mixed income transit oriented housing. It defines the scale for which each strategy is applicable: state/region, corridor, city/locality, neighborhood.</td>
<td>Transit Oriented Development Policy and Strategy Guidance</td>
<td>Primarily focuses on local areas, but has applicability for region-wide scales.</td>
<td>N/A</td>
<td>N/A</td>
<td><a href="http://www.reconnectingamerica.org/public/display_asset/091609zx201mixedhou">http://www.reconnectingamerica.org/public/display_asset/091609zx201mixedhou</a> sefinal</td>
<td>Published in November 2009.</td>
</tr>
<tr>
<td>Center for Transit Oriented Development</td>
<td>Realizing the Potential for Sustainable and Equitable TOD: Recommendations to the Interagency Partnership on Sustainable Communities</td>
<td>This policy white paper discusses coordination efforts between government agencies on how to attain sustainable development. It includes a discussion on livability principles and their application to TOD; the history of federal government agency coordination between USDOT, HUD and EPA for sustainability and livability. Best practices for agency coordination at the state, regional and local level provide examples on legislative measures that were passed and funding programs. The paper presents recommendations for short and long term actions for different agencies.</td>
<td>Sustainability White Paper</td>
<td>All scales</td>
<td>N/A</td>
<td>N/A</td>
<td><a href="http://www.reconnectingamerica.org/public/display_asset/091118trasustainabilityrecommendationsfinal">http://www.reconnectingamerica.org/public/display_asset/091118trasustainabilityrecommendationsfinal</a></td>
<td>Published in November 2009.</td>
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<td>Indianapolis MPO</td>
<td>Multimodal Corridor and Public Space Design Guidelines</td>
<td>This manual is a tool for the region’s jurisdictions to guide implementation of public improvements within the ROW that are based on attaining a balanced transportation system and thoroughfare character. It integrates transportation and land use to enhance economic and community development and sustain the region’s quality of life and environmental health. The manual outlines 6 types of pedestrian districts, mapped as part of a Regional Pedestrian Plan and establishes various multimodal corridor typologies. The design guidelines focus on those elements that are within the public and quasi-public sphere, providing detailed guidance on the application of certain multimodal treatments for various conditions. Numerous diagrams and pictures illustrate the presented concepts.</td>
<td>Corridor Design Guidelines</td>
<td>Local</td>
<td>Automobile, Pedestrian, Bicycle, Local Bus, Rapid Bus, Light Rail</td>
<td>The six pedestrian districts outlined in the Regional Pedestrian Plan form the basis of the district design guidelines. The terms Ped Districts and Multimodal Districts appear to be used interchangeably in places, yet they are defined slightly differently. A multimodal district is 1-2 mile radius, bikeable scale; consists of district node, center, and subdistrict. A pedestrian district is 1/4 - 1/2 mile radius.</td>
<td><a href="http://www.indympo.org/Plans/Documents/MM_DesignGuidelines.pdf">http://www.indympo.org/Plans/Documents/MM_DesignGuidelines.pdf</a></td>
<td>Approved in August 2008</td>
</tr>
<tr>
<td>Florida Department of Transportation</td>
<td>A Framework for Transit Oriented Development in Florida</td>
<td>This framework is a tool to help local communities take the first steps in planning for TOD. It provides key considerations and includes a set of station area place types that address land use and design considerations. The guidelines present qualitative and quantitative information to assess how transit ready existing development patterns are and establish targets to create transit supportive development patterns in the future. The document provides goals, benchmarks and strategies for implementation across the state.</td>
<td>Transit Oriented Development Framework and Policy Guide</td>
<td>State</td>
<td>Heavy Rail, Commuter Rail, Streetcar, Light Rail, Bus Rapid Transit, Express Bus, Local Bus, Pedestrian, Bicycle, Automobile, Park &amp; Ride</td>
<td>The framework illustrates multiple levels TOD concepts at the system, corridor and station area scales. Place types are defined by varying levels and types of activity and accessibility, varying types of transit, and varying community contexts. Ranges for intensity/density indicators, mix of uses, network and building design, and parking parameters are defined for each place type.</td>
<td>Available from the Florida Department of Transportation and Department of Community Affairs.</td>
<td>Draft Published in October 2010</td>
</tr>
<tr>
<td>Utah’s Wasatch Front</td>
<td>Transit Oriented Development Guidelines</td>
<td>The Wasatch Front TOD guidelines identify and provide general qualitative guidance for targeted TOD areas for a large region with different types of transit systems. The report highlights several main concepts of TOD design including circulation, urban design, and parking and transportation demand policy, without providing quantitative parameters and standards for TOD place types. It contains a comprehensive section on implementation and focuses on economic feasibility of TOD.</td>
<td>Transit Oriented Development Guidelines</td>
<td>Region</td>
<td>Pedestrian, Bicycle, Rapid Bus, Feeder Bus, Light Rail, Commuter Rail, Automobile, Park &amp; Ride, Kiss &amp; Ride</td>
<td>The document generally defines station areas as the area within walking distance of the station. It discusses ways in which TOD context can vary between station areas, but does not identify or organize specific place types or districts. Layers that contribute to a TOD’s context include place/location (urban core, suburban employment center), development type (infill, greenfield), and transit type.</td>
<td><a href="http://www.envisionutah.org/WasatchFront%20Transit%20Guidelines2002.pdf">http://www.envisionutah.org/WasatchFront%20Transit%20Guidelines2002.pdf</a></td>
<td>Published in 2002</td>
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<tr>
<td>City of Charlotte, NC</td>
<td>Urban Street Design Guidelines</td>
<td>This document is Charlotte's 'Complete Streets' guidelines. It acknowledges conflicts between road users (pedestrians, motorists, neighbors, etc) and provides design guidelines and standards for road segments and intersections. The guidelines go hand-in-hand with the Transportation Action Plan (TAP) and the Centers, Corridors and Wedges growth framework.</td>
<td>Corridor Design Guidelines</td>
<td>Local</td>
<td>Automobile, Pedestrian, Bicycle, Bus Transit</td>
<td>Charlotte's streets are classified according to five street types that follow a continuum from pedestrian-oriented (Main Streets) to auto-oriented (Parkways).</td>
<td><a href="http://charmeck.org">http://charmeck.org</a> /city/charlotte/Transportation/PlansProjects/Pages/Urban%20Street%20Design%20Guidelines.aspx</td>
<td>Adopted in October 2007.</td>
</tr>
<tr>
<td>City of Charlotte, NC</td>
<td>Center, Corridors and Wedges Growth Framework</td>
<td>The Centers, Corridors and Wedges concept is Charlotte's vision for future growth. The framework provides general guidance for future area plans on where and how to focus new growth and development. It identifies different areas with different characteristics and sub-areas within those areas. It discusses transportation and public facilities that should accompany new growth to allow the system to function effectively, as appropriate for the geographic type.</td>
<td>Growth Management Policy</td>
<td>Local</td>
<td>Automobile, Pedestrian, Bicycle, Bus Transit</td>
<td>Charlotte's land area is organized into three different types. Activity centers are concentrated areas of economic activity. Growth corridors are radial spokes from city center to city limits with typically at least three high capacity transportation facilities running parallel to each other. Corridors are wide swaths of land and include a variety of land use types. Wedges are areas in between. Transit station areas are a subarea type of growth corridors, the half-mile around the station. In addition to station areas, there are mixed use centers that do not correlate to a particular corridor but have a goal for multimodal transportation network.</td>
<td><a href="http://charmeck.org">http://charmeck.org</a> /city/charlotte/Planning/AreaPlanning/CentersCorridorsWedges/Pages/Home.aspx</td>
<td>Adopted in August 2010.</td>
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<tr>
<td>City of Denver, CO: Community Planning &amp; Development</td>
<td>Transit Oriented Development (TOD) Strategic Plan</td>
<td>Between the T-Rex line and FastTracks, Denver is planning 23 new transit stations and five new transit corridors. This guide is intended to help city staff to prioritize the planning and implementation activities for TOD. It provides background info on what TOD is and TOD in the Denver context; specific city-wide action strategies to implement TOD, and briefly identifies issues, opportunities and recommendations for transit corridors and station areas. Parameters and standards for station areas are reserved for individual station plans, most of which are completed or underway.</td>
<td>Transit Oriented Development Policy</td>
<td>Region</td>
<td>Regional Bus, Local Bus, Light Rail, Park &amp; Ride</td>
<td>The document contains a TOD typology matrix that categorizes each station area into one of seven different typologies and specifies the market opportunity and priority. TOD typologies are distinguished by desired land use mix, desired housing types, commercial and employment types, proposed scale, and transit system function.</td>
<td><a href="http://www.denvergov.org/HomePage/Tab/395229/Default">http://www.denvergov.org/HomePage/Tab/395229/Default</a> .aspx</td>
<td>Published in August 2006.</td>
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<tr>
<td>City of Denver, CO: Regional Transportation District (RTD)</td>
<td>FasTracks: Strategic Plan for Transit Oriented Development</td>
<td>The Regional Transportation District (RTD) is the regional transit agency for the Denver-Aurora and Boulder metro areas, and FasTracks is RTD’s 12-year comprehensive transit plan. FasTracks provides the TOD vision, goals, and strategies. It outlines the review process for TOD development proposals and focuses on defining the roles of RTD, local governments, private developers and other professional and research organizations.</td>
<td>Agency Procedural Policy</td>
<td>Region</td>
<td>Commuter Rail, Light Rail, Bus Rapid Transit, Park &amp; Ride</td>
<td>The document does not discuss different TOD contexts, but it directs RTD to track all development within a half-mile of the transit stations and prepare an annual report on status of TOD including quantitative, spatial and trends analysis of TOD development.</td>
<td><a href="http://www.rtdfastracks.com/main45">http://www.rtdfastracks.com/main45</a></td>
<td>Revised in September 2010.</td>
</tr>
<tr>
<td>Sacramento Regional Transit</td>
<td>Transit for Livable Communities</td>
<td>Sacramento’s land use plan for 21 light rail stations consists of conceptual land use plans including transit overlay zones and proposed development standards; joint development strategies and development plans for property owned by the transit agency; and a discussion on barriers to TOD and implementation measures. It includes interim station area land use standards to regulate development until permanent transit zoning is adopted.</td>
<td>Transit Oriented Development Guidelines</td>
<td>Local</td>
<td>Light Rail</td>
<td>Three light rail lines are identified, and the land use plans for each light rail station cover a quarter-mile radius around the station.</td>
<td><a href="http://www.sacrt.com/TLC/index.stm">http://www.sacrt.com/TLC/index.stm</a></td>
<td>Approved in August 2002.</td>
</tr>
<tr>
<td>Bay Area Rapid Transit (BART) - San Francisco, CA</td>
<td>BART Station Access Guidelines (Apr 2003)</td>
<td>These guidelines identify access priorities for different travel modes around transit stations and set goals for future mode share. Key considerations and design principles for improving non-motorized access to transit including direct walking routes, safety, pedestrian-friendly design and wayfinding information are provided.</td>
<td>Station Area and Facility Design Guidelines</td>
<td>Region, Local</td>
<td>Pedestrian, Bicycle, Local Bus, Automobile, Light Rail, Heavy Rail</td>
<td>N/A</td>
<td><a href="http://www.bart.gov/about/planning/station.aspx">http://www.bart.gov/about/planning/station.aspx</a></td>
<td>Published in April 2003.</td>
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<tr>
<td>Bay Area Rapid Transit (BART) - San Francisco, CA</td>
<td>BART Transit Oriented Development Guidelines (Jun 2003)</td>
<td>BART's TOD Guidelines clarify the agency's priorities for TOD. It presents recommendations to assist planning and development process. It purposefully does not cite dimensions or specify precise land uses to allow flexibility in adapting to local conditions. The guidelines focus on connecting to destinations and providing design features for different modes to foster community, increase safety, and make the transportation system work. Minimum densities within station areas are included</td>
<td>Transit Oriented Development Guidelines</td>
<td>Region</td>
<td>Pedestrian, Bicycle, Local Bus, Automobile, Light Rail, Heavy Rail</td>
<td>The guidelines identify three different “zones of urgency” within a station area, defined by the intent and purpose of the people moving through them. Design principles reflect the state of urgency within each zone.</td>
<td><a href="http://www.bart.gov/about/planning/station.aspx">http://www.bart.gov/about/planning/station.aspx</a></td>
<td>Published in June 2003.</td>
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<td>Metro Portland, OR</td>
<td>Transit Oriented Development Program</td>
<td>The Metro Portland TOD program is admired across the nation for its public-private partnerships, investments and incentives in TOD projects. The 2040 Growth Concept calls for a significant amount of the region’s growth to be concentrated in medium-to high-density mixed use, walkable urban centers and corridors linked by high quality transit service. The TOD Program provides funds for development projects within designated TOD areas (around rail station areas and frequent bus stops).</td>
<td>Development Assistance Program</td>
<td>Region</td>
<td>Heavy Rail, Light Rail, Streetcar, Express Bus</td>
<td>Metro Portland assesses the performance of its station areas through by looking at its transit orientation and market strength. The level of performance determines Metro’s investment priorities.</td>
<td><a href="http://www.oregonmetro.gov/index.cfm/go/by.web/id=140">http://www.oregonmetro.gov/index.cfm/go/by.web/id=140</a></td>
<td>Ongoing TOD Program created in 1998.</td>
</tr>
<tr>
<td>Center for Transit Oriented Development</td>
<td>Performance-Based Transit Oriented Development Typology Guidebook</td>
<td>This research report introduces a unique methodology for characterizing and analyzing TOD performance. It organizes rail station areas into place types according to VMT and percentage of workers to residents. It also looks at other characteristics relative to the place types (e.g. auto ownership, transportation costs, commute travel behavior, employment proximity, and urban form. The report provides case studies for each of the nine place types and includes scenario studies to analyze effect of additional growth in reducing VMT. The report provides a template for communities to assess station areas in comparison to others and can be used to determine how to lower VMT in an individual zone.</td>
<td>Research Report</td>
<td>National, Local</td>
<td>Commuter Rail, Light Rail, Heavy Rail</td>
<td>Place types are organized by VMT on vertical axis and use mix on horizontal axis. The purpose is to compare place types within a system or across multiple systems. Other measures, called normative metrics can be compared to the place types (e.g. travel time to work, avg median income, autos per HH, gross density, etc).</td>
<td><a href="http://reconnectingamerica.org/public/display_asset/2010_performancebasedtodtypologyguidebook">http://reconnectingamerica.org/public/display_asset/2010_performancebasedtodtypologyguidebook</a></td>
<td>Published in December 2010.</td>
</tr>
<tr>
<td>New Jersey Department of Transportation and Pennsylvania Department of Transportation</td>
<td>Smart Transportation Guidebook: Planning and Designing Highways and Streets that Support Sustainable and Livable Communities</td>
<td>This resource provides guidance on planning and designing all classes of non-limited access roadways in New Jersey and Pennsylvania to fit within the existing and planned community context. The handbook provides tools and techniques to integrate context sensitivity into the project development processes of the DOTs. It presents a set of land use contexts and roadway types that influence the appropriate design values. It also provides design guidelines for roadway elements like travel lanes and on-street parking, roadside elements like pedestrian and transit facilities, and general systems issues like access management and traffic calming.</td>
<td>Multimodal Corridor Planning Strategies and Design Guidelines</td>
<td>State</td>
<td>Automobile, Bicycle, Pedestrian, Bus Transit</td>
<td>The handbook defines different land use contexts according to ____ and roadway types based on ____.</td>
<td><a href="http://www.nj.gov/transportation/community/mobility/guidelines/s.htm">http://www.nj.gov/transportation/community/mobility/guidelines/s.htm</a></td>
<td>Published in March 2008.</td>
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<td>(California Department of Transportation)</td>
<td>Smart Mobility: A Call to Action for the New Decade</td>
<td>The Smart Mobility handbook represents an approach to integrating transportation and land use. It presents a methodology for understanding smart mobility within the context of location efficiency and identifies different place types throughout the state based on location efficiency potential. The place types create a distinct context for transportation investments and opportunities for mobility benefits. The handbook provides multimodal performance measures for smart mobility, compares them to conventional Caltrans performance measures, and explains how the performance measures apply to different place types.</td>
<td>Growth Framework</td>
<td>State</td>
<td>Pedestrian, Automobile, Transit, Bicycle</td>
<td>CalTrans is an example of a statewide agency that has categorized places into place types. Place types are based on locational efficiency, which considers levels of community design and regional accessibility. They are necessarily broad and should be applied at a general planning level of detail. Finer-grained analysis would show large areas characterized as one place type would actually consist of several subareas with characteristics of other place types.</td>
<td><a href="http://www.dot.ca.gov/hq/tpp/offices/ocp/smf.html">http://www.dot.ca.gov/hq/tpp/offices/ocp/smf.html</a></td>
<td>Published in February 2010.</td>
</tr>
<tr>
<td>Virginia Department of Rail and Public Transportation</td>
<td>Transit Service Design Guidelines</td>
<td>These guidelines help localities understand their options for implementing transit service and explain which planning activities should be conducted to make the effort successful. The document explains the range of different transit options available and helps localities determine which transit technology may be appropriate for their community based on factors like density, diversity, design and transit station type.</td>
<td>Policy Guidance on Transit Service</td>
<td>Statewide guidance for regions and localities</td>
<td>Heavy rail, Light Rail, Streetcar/Trolley, Express Bus, Local Bus, and others</td>
<td>The document acknowledges the spectrum of transit network designs, target markets and service area sizes throughout the state. It contrasts the radial systems of VRE and WMATA with the grid-type bus networks of more dispersed areas.</td>
<td><a href="http://www.drpt.virginia.gov/activities/Transit_ref_materials.aspx">http://www.drpt.virginia.gov/activities/Transit_ref_materials.aspx</a></td>
<td>Finalized in November 2008.</td>
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<tr>
<td>Virginia Department of Rail and Public Transportation</td>
<td>Amtrak Station Area Planning and Land Use Analysis</td>
<td>DRPT staff and local planners collaborated to create six transit oriented land use plans at existing and potential Amtrak stations along the I-95/I-64 rail corridor linking Washington DC, Richmond and Newport News. Station Area Plans present land use plans for compact development with particular urban design characteristics around the station areas to achieve a walkable transit oriented place. The Plans provide in-depth analyses of the resulting effects of creating these TODs, including assessed market conditions, economic impacts, and potential funding mechanisms. Traffic, transit, pedestrian and bicycle analyses assess the effects of increased activity around the train station for all modes, and infrastructure and service improvements are noted in the report. Environmental effects for water resources, historic sites, hazardous materials and protected species are also addressed.</td>
<td>TOD Station Area Plans</td>
<td>Regional (Amtrak Corridor) and Local (Station Areas)</td>
<td>Commuter Rail, Local Bus, Pedestrian, Bicycle, Automobile</td>
<td>The document identifies each station’s unique function and character within the corridor and establishes overarching themes specific to each station area. It is unclear why each station was chosen, but together they represent a range of station area types, from rural towns to downtown centers.</td>
<td>Available from the Virginia Department of Rail and Public Transportation.</td>
<td>Finalized in November 2008.</td>
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(DISTRICT TYPE)  
(DESRIPTION) | URL | STATUS |
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| Washington  
Metropolitan Area  
Transit Authority  
(WMATA) | Station and Site  
Access Planning  
Manual | Illustrates how station site facilities should  
be planned to optimize pedestrian and  
vehicular access to Metro, with focus on  
physical design and operational issues.  
Similar to BART’s Station Access Guidelines. | Station Area and Facility  
Design Guidelines | Regional (Metro system) and  
Local (Station Areas) | Heavy rail, Pedestrian, Bicycle,  
Local bus, Light Rail, Streetcar,  
Kiss & Ride, Park & Ride | Stations are classified into three  
general types: Core Stations,  
Mid-Line Station, and Terminus  
Stations, according to the variety  
of modes used to access that  
station and surrounding  
development density. | http://www.wmata.c  
em/pdfs/planning/St  
atom%20Access/SSA  
PM.pdf | Published in  
May 2008. |
| Washington  
Metropolitan Area  
Transit Authority  
(WMATA) | Joint Development  
Policies and  
Guidelines | Outlines the general practices of the joint  
development program. Under this program,  
WMATA markets publicly owned property to  
developers to create TOD projects. WMATA  
selects a developer to work with WMATA  
and local jurisdictions in the development of  
the property to integrate transit investments  
in the development process. The Policies  
and Guidelines document specifies the  
program’s objectives, procedures, and roles  
and responsibilities of WMATA, local  
jurisdictions, developers and the  
community. | Procedural Guidelines | Region | Heavy rail, Local Bus | N/A | http://www.wmata.c  
em/pdfs/business/G  
uidelines%20Revisio  
n11-20-08.pdf | Revised in  
November 2008. |
| Fairfax County and  
Tysons Land Use Task  
Force | Transforming Tysons:  
Vision and Area Wide  
Recommendations | This integrated land use and transportation  
plan provides a parcel level land use plan  
with intensity focused around transit,  
transportation recommendations for a  
variety of street types that accommodate all  
modes, and urban design guidelines  
specified by character zones. It is a  
nationally recognized model for TOD  
planning. | Transit Oriented  
Development Plan | Local | Heavy Rail, Circulator Bus,  
Automobile, Bicycle,  
Pedestrian | The Tysons area is divided into  
eight districts; four surrounding  
the future rail stations and four  
creating transitions between  
adjacent communities. 95% of  
development is concentrated  
within walking distance of transit  
(1/2 mile of rail or 600 feet of the  
circulator). The urban design  
guidelines organize the area into  
three different character zones  
(station core, circulator and  
transition) and provide guidelines  
for blocks, streets, pedestrian  
zones and buildings. Streets are  
classified by function and range  
from arterial to local street. | http://www.fairfaxc  
ounty.gov/dpz/tyson  
scorner/finalreport.h  
tm | Revised in  
October 2008. Fairfax  
County Comprehensive  
Plan amended in  
June 2010. |
<p>| ORGANIZATION                  | DOCUMENT/ POLICY TITLE                                      | DESCRIPTION                                                                                                                                                                                                 | DOCUMENT/ POLICY TYPE | SCALE (STATE, REGION, LOCAL) | TRANSPORTATION SYSTEM (ROADWAY, TRANSIT TYPE, BIKE/PED) | PLACE TYPE / CORRIDOR TYPE / DISTRICT TYPE (DESCRIPTION) | URL                                                        | STATUS                        |
|------------------------------|-------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|--------------------------------|---------------------------------------------------------|----------------------------------------------------------|----------------------------------------------------------|
| Hampton Roads Metropolitan Planning Organization | Vision Plan Document: A Transit Vision Plan for Hampton Roads | This vision plan acknowledges the need for integration of land use and transit plans. The plan identifies major activity centers based on HRPDC demographic estimates and projections and examines the land use composition of current and potential transit corridors that could connect the centers. Potential transit corridors were evaluated to assess the “transit supportiveness” of the governing land use policies and regulations and the feasibility of implementation. The document includes guidelines for transit supportive development, drawing mainly from the Virginia Transit Service Design Guidelines (4Ds) and FTA guidelines. It provides a matrix of place types localities can use to plan for feasible future transit corridors. It also includes a vision for transportation demand management. | Vision Plan          | Region                        | Local Bus, Enhanced bus, Express bus, Bus rapid transit, Streetcar/Trolley, Light Rail, Commuter rail | Place types are categorized by land use type, density, mix and design characteristics. Each place type is given a range of typical housing and job densities and a list of feasible transit options. The place types do not have a specific shape or area size, and can be applied at any scale. | <a href="http://www.hrpdc.org/TPO_SpecReports.asp">http://www.hrpdc.org/TPO_SpecReports.asp</a>                | Draft Report published in April 2009. Public meetings held and public comments received by December 2010. Final Report underway. |
| City of Norfolk               | Downtown Norfolk 2020 Plan                                  | In the advent of light rail, Norfolk’s downtown plan envisions itself as one large TOD with all development within a ten minute walk of transit, using the light rail stations as foundations. The plan focuses on the creation of place around transit and along the waterfront and the creation of improved connections between the downtown the city’s neighborhoods. | Vision Plan &amp; Transit Oriented Development Station Area Plans | Local                           | Light Rail, Local Bus, Pedestrian                        | The plan focuses on several centers located along the waterfront, around transit stations, or close to a new town square to be served by shuttle bus. Each small area has a unique vision and purpose. | <a href="http://www.norfolk.gov/Planning/Downtown.asp">http://www.norfolk.gov/Planning/Downtown.asp</a>            | Adopted in April 2009.                                      |
| City of Norfolk               | Downtown Norfolk Pattern Book: Architectural Guidelines for Place Making | The Pattern Book accompanies the Downtown Norfolk 2020 Plan and provides guidelines for urban and building design that will be consistent with the vision of the downtown plan. The book is essentially a step-by-step handbook that provides guidelines based on street type (urban spatial type), site type, building height (façade type), and architectural style. | Design Guidelines     | Local                           | N/A                                      | The streets are categorized by existing or future urban character (e.g., neighborhood streets vs. commercial streets). Downtown greens and squares are also identified as a specific urban spatial type. | <a href="http://www.norfolk.gov/Planning/PDFFiles/Downtown_Pattern_Book.pdf">http://www.norfolk.gov/Planning/PDFFiles/Downtown_Pattern_Book.pdf</a> | Adopted in April 2009.                                      |</p>
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<tr>
<td>Arlington County, Virginia</td>
<td>Transit Corridor Growth Strategy</td>
<td>Since the 1960s, Arlington County has successfully concentrated high-density development within Metro corridors and preserved lower-density residential areas throughout the County using a variety of planning and policy documents, regulatory tools and ordinances. The General Land Use Plan describes broad goals and establishes policies that focus on areas within Metro Station Areas and Metro Corridors. It also establishes zoning mechanisms to achieve these goals. Policy plans and land use plans for the Rosslyn-Ballston and Jefferson-Davis Metro Corridors provide the foundation for a unified long-range planning approach. Sector plans for the individual station areas dig into the details of urban design, zoning, transportation, and market trends, distinguishing the unique character of each station area. Arlington County continually tracks development statistics within the Metro corridors dating back to 1960 to quantify its success.</td>
<td>TOD and Growth Management Policy</td>
<td>Regional, Local</td>
<td>Heavy Rail, Pedestrian</td>
<td>N/A</td>
<td><a href="http://www.arlingtonva.us/departments/CPHD/planning/docs/CPHDPlanningDocsMain.aspx#bs_plan">http://www.arlingtonva.us/departments/CPHD/planning/docs/CPHDPlanningDocsMain.aspx#bs_plan</a></td>
<td>Strategy adopted in early 1970s in preparation for Metro system. General Land Use Plan last updated in June 2010. Sector Plans range in date from the 1980s to the present.</td>
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<tr>
<td>Arlington County, Virginia</td>
<td>General Land Use Plan</td>
<td>The General Land Use Plan's goals include concentrating high-density development, promoting mixed use development, and increasing the supply and variety of housing within the Metro corridors. It concentrates the highest density uses within walking distance of Metro stations; tapers densities, heights and uses down to single-family residential neighborhoods; and provides for a mix of office, hotel, retail and residential development. The Plan establishes regulatory mechanisms, namely special coordinated mixed use zoning districts which allow FARs that exceed general zoning designations and special residential zoning districts which promote tapering of heights between higher-density commercial development and lower-density residential neighborhoods.</td>
<td>Land Use Plan</td>
<td>Regional, Local</td>
<td>Heavy Rail, Pedestrian</td>
<td>Each station area serves a unique function within the corridor. Rosslyn is a first class office and business center. Courthouse is the County's government center. Clarendon is planned as an &quot;urban village.&quot; Virginia Square contains a concentration of residential, cultural and educational facilities. Ballston is developing as Arlington's &quot;new downtown.&quot;</td>
<td><a href="http://www.arlingtonva.us/departments/CPHD/planning/docs/GLUP.aspx">http://www.arlingtonva.us/departments/CPHD/planning/docs/GLUP.aspx</a></td>
<td>Last updated in June 2010.</td>
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<tr>
<td>Arlington County, Virginia</td>
<td>Crystal City Sector Plan</td>
<td>This sector plan provides the policy framework, master plan, and implementation steps for the Crystal City planning area, a 260-acre (0.4 sq. mi.) area within the 361-acre (0.6 sq. mi.) Crystal City Metro Station Area, as defined by the General Land Use Plan. It includes a discussion on the impact of regional growth, including identification of activity centers and their dispersion along major transportation corridors. It is an example of high density mixed use neighborhood and an economic engine with high-rises approaching full build-out of existing plans.</td>
<td>Station Area Plan</td>
<td>Local</td>
<td>Heavy Rail, Automobile, Pedestrian, Bicycle, Commuter Rail, Local Bus, Express Bus</td>
<td>The planning area for station has an oblong shape. It is 1.3 miles from north to south and varies in length from east to west with a maximum width of 0.5 miles. It excludes the areas of low-density residential. Within the planning area, the plan defines neighborhoods and districts based on use characteristics and identifies destinations. It also distinguishes the ways in which the transportation infrastructure influences the area, local and collector streets connecting places within the area, and large arterials acting as barriers or edges to the districts.</td>
<td><a href="http://www.arlingtonvirginiausa.com/index.cfm/11250">http://www.arlingtonvirginiausa.com/index.cfm/11250</a></td>
<td>Draft published in June 2010. Adopted in September 2010 with final changes to be incorporated.</td>
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<tr>
<td>Arlington County, Virginia</td>
<td>East Falls Church Area Plan</td>
<td>The East Falls Church Area represents an example of a commuter station area with park-and-ride and kiss-and-ride facilities. It is less dense than the other Metro station areas within Arlington County. The East Falls Church Area Plan provides a policy framework, concept plan, design guidelines, and implementation actions.</td>
<td>Station Area Plan</td>
<td>Local</td>
<td>Heavy rail, Pedestrian, Bicycle, Automobile, Local Bus</td>
<td>The study area includes the commercial development and multi-family housing along I-66 and some of the single-family housing. Much of the existing single-family housing is not included, even though it is within a quarter-mile of the Metro station, in an effort to preserve it. The plan introduces the Neighborhood Center concept, a collection of three low- to medium-scale mixed use development nodes, each with its own specific character and role. These are essentially different mini-districts working together to create a cohesive whole.</td>
<td><a href="http://www.arlingtonva.us/departments/CPHD/forums/eastfallschurch.aspx">http://www.arlingtonva.us/departments/CPHD/forums/eastfallschurch.aspx</a></td>
<td>Draft published in January 2011.</td>
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<tr>
<td>Arlington County, Virginia</td>
<td>Clarendon Sector Plan</td>
<td>Clarendon represents a future “urban village” with public spaces, accessibility, connectivity and a rich mix of uses to achieve a sense of place and uniqueness. The sector plan includes policies on urban form, transportation, land use, historic preservation and other topics. It includes urban design guidelines and a matrix of implementation recommendations.</td>
<td>Station Area Plan</td>
<td>Local</td>
<td>Heavy rail, Pedestrian, Bicycle, Automobile, Local Bus</td>
<td>The station area boundary is approximately a quarter-mile radius within the Metro Station areas.</td>
<td><a href="http://www.arlingtonva.us/departments/CPHD/planning/Docs/Main.aspx#clarendon">http://www.arlingtonva.us/departments/CPHD/planning/Docs/Main.aspx#clarendon</a></td>
<td>Original Sector Plan adopted in 1984. Revised and re-adopted in 2006.</td>
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<tr>
<td>Arlington County, Virginia</td>
<td>Master Transportation Plan</td>
<td>Arlington’s Transportation Plan echoes the policies of the General Land Use Plan. One main goal of the plan is moving more people without more traffic by implementing transit oriented and mixed use development for better access and use of the transportation system, minimizing person delay across modes rather than focusing exclusively on minimizing vehicle delay, and encouraging bicycling, walking, transit, carpooling and telecommuting.</td>
<td>Transportation Plan</td>
<td>Local</td>
<td>Heavy rail, Pedestrian, Bicycle, Automobile, Local Bus</td>
<td>N/A</td>
<td><a href="http://www.arlingtonva.us/departments/EnvironmentalServices/dtp/transportation/mtp/MTP_Draft.aspx">http://www.arlingtonva.us/departments/EnvironmentalServices/dtp/transportation/mtp/MTP_Draft.aspx</a></td>
<td>Goals and policies adopted in November 2007. Final element adopted in February 2011.</td>
</tr>
<tr>
<td>Arlington County Transportation Demand Research Center</td>
<td>Arlington County Commercial Building Research Summary Report</td>
<td>Arlington County Commuter Services (ACCS) distributed a survey to employers and employees in Arlington County to study roles of location factors, transportation facilities, commuter assistance services and other factors on business location decisions and employee’s travel choices in Arlington County. The survey tracked distance to transit, area of the county, level of “urban-ness,” availability of commuter services, parking availability and parking charge.</td>
<td>Survey Results</td>
<td>County</td>
<td>Carpool, vanpool, bike, pedestrian, bus, train, drive alone</td>
<td>The document does not identify place type, but accounts for differences in level of “urban-ness” and proximity to Metrorail stations and bus stops.</td>
<td><a href="http://www.commuterpage.com/research/study_list.asp?jobID=ACCS030&amp;studyID=110">http://www.commuterpage.com/research/study_list.asp?jobID=ACCS030&amp;studyID=110</a></td>
<td>Published in December 2009.</td>
</tr>
<tr>
<td>Arlington County Transportation Demand Research Center</td>
<td>2007 State of the Commute Study: Arlington Perspective. The Factors of Success in Reducing Drive Alone Commuting in Arlington</td>
<td>This study assessed the factors of reducing the drive alone mode share, including market need, ridesharing infrastructure, commuter mindset, employer support and involvement, telework opportunity, and societal awareness and support of ridesharing. It provides recommendations for ACCS to reduce the drive alone mode share for work trips.</td>
<td>Survey Results and Recommendations</td>
<td>County</td>
<td>Drive alone, Metrorail, carpool, vanpool, bus, bike, pedestrian</td>
<td>N/A</td>
<td><a href="http://www.commuterpage.com/research/study_list.asp?jobID=ACCS035&amp;studyID=120">http://www.commuterpage.com/research/study_list.asp?jobID=ACCS035&amp;studyID=120</a></td>
<td>Published in March 2010.</td>
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<tr>
<td>Loudoun County</td>
<td>TOD Planning and Zoning Districts</td>
<td>Loudoun County has included policies for transit oriented development into its comprehensive plan. and has instituted several zoning codes to actively encourage this type of development. The County’s two transit nodes are key components of its suburban policy area, intended to limit sprawl, reduce public costs, provide the critical mass for bus and rail transit, provide a development alternative the separates auto-oriented land uses from transit oriented uses.</td>
<td>Comprehensive Plan and Zoning Policy</td>
<td>Local</td>
<td>Bus Transit, Rail Transit, Pedestrian, Automobile</td>
<td>There are two transit nodes within the county. One is a Transit-Related Employment Center, consisting of offices and support services. The other is a Transit Oriented Development, a mix of high-intensity land uses ranging from high-density residential uses, regional offices, entertainment and cultural centers and other businesses.</td>
<td><a href="http://www.loudoun.gov/Default.aspx?tabid=327&amp;lnpath=/ComprehensivePlan">http://www.loudoun.gov/Default.aspx?tabid=327&amp;lnpath=/ComprehensivePlan</a></td>
<td>Incorporated in current Comprehensive Plan and Zoning Ordinance.</td>
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<td>Loudoun County Department of Planning</td>
<td>Route 28 Corridor Plan</td>
<td>Loudoun County is working on an amendment to their comprehensive plan for the Route 28 Corridor. The Corridor Plan and Implementation Strategy were created as part of this effort. The vision for this corridor includes pedestrian- and transit oriented mixed use office centers. The Plan includes policies for land use, transportation, design, economic development, housing and sustainability. Policies include a multimodal transportation network, including transit, within the corridor, and highest intensities within a quarter-mile of planned bus or rail stations. Design policies and standards promote general TOD design and will be accompanied by an illustrative design handbook. The implementation plan outlines specific action items like amending existing zoning ordinance.</td>
<td>Corridor Plan and Implementation Strategy</td>
<td>Local</td>
<td>Automobile, General Transit (bus or rail), Pedestrian, Bicycle</td>
<td>N/A</td>
<td><a href="http://www.loudoun.gov/Default.aspx?tabid=2978">http://www.loudoun.gov/Default.aspx?tabid=2978</a></td>
<td>Draft Plan dated February 2011. Board of Supervisors currently reviewing.</td>
</tr>
<tr>
<td>City of Roanoke, VA</td>
<td>Street Design Guidelines</td>
<td>Roanoke's guidelines accommodate all modes of transportation on its city streets and are consistent with Complete Streets principles. The document provides design guidelines for each character district as well as general streetscape element guidelines applicable for all areas within the city. Right-of-way cross sections for each street class illustrate options for new streets (preferred) and for retrofitting in situations where the preferred is not feasible.</td>
<td>Multimodal Corridor Design Guidelines</td>
<td>Local</td>
<td>Automobile, Truck, Local Bus, Bicycle, Pedestrian</td>
<td>Streets are classified into three categories by function and character: arterials, collectors and locals. Land area is organized into eight character districts (downtown, industrial, etc) depending on general building style, development form and land purpose. Connection between character and function - street types within character districts</td>
<td><a href="http://www.roanokeva.gov/85256A8D0062AF37/CurrentBaseLink/B444FC8E084DA4E8525A81D0049F58F/SfeStREETDESIGNGUIDELINES.pdf">http://www.roanokeva.gov/85256A8D0062AF37/CurrentBaseLink/B444FC8E084DA4E8525A81D0049F58F/SfeStREETDESIGNGUIDELINES.pdf</a></td>
<td>Adopted in July 2007.</td>
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<tr>
<td>Virginia Department of Transportation</td>
<td>Policy for Integrating Bicycle and Pedestrian Accommodations</td>
<td>This policy integrates bicycle and pedestrian accommodations into all of VDOT's procedures and projects. It requires that all transportation projects will start with the assumption that accommodation for bicycling and walking will be provided. As a result of this policy, VDOT has updated its procedures and best practices to include guidelines for coordinating with localities, planning level cost estimates, and updated construction and maintenance scoping forms.</td>
<td>Transportation Policy</td>
<td>State</td>
<td>Bicycle, Pedestrian, Automobile</td>
<td>N/A</td>
<td><a href="http://www.virginiadot.org/programs/resources/bike_ped_policy.pdf">http://www.virginiadot.org/programs/resources/bike_ped_policy.pdf</a></td>
<td>Adopted in March 2004.</td>
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<tr>
<td>Virginia Department of Transportation</td>
<td>State Bicycle Policy Plan</td>
<td>The Bicycle Policy Plan provides a framework to implement the bicycle portion of VDOT’s Policy for Integrating Bicycle and Pedestrian Accommodations. It establishes policies for bicycle facility planning and design, identifies opportunities for enhancing coordination, recommends training programs, and sets forward benchmarks for tracking implementation over time.</td>
<td>Transportation Policy Plan</td>
<td>State</td>
<td>Bicycle, Pedestrian, Automobile</td>
<td>N/A</td>
<td><a href="http://www.virginiadot.org/programs/bicycling_and_walking/bicycle_policy_plan.asp">http://www.virginiadot.org/programs/bicycling_and_walking/bicycle_policy_plan.asp</a></td>
<td>Draft published in April 2010.</td>
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<tr>
<td>Virginia Department of Transportation</td>
<td>Context Sensitive Solutions Policy</td>
<td>The CSS policy requires VDOT to consider that motorists, pedestrians, bicyclists, and public transit vehicles jointly use transportation systems for both transportation and recreational purposes. It promotes transportation facilities that provide transportation safety and mobility, while also fitting the physical setting and reflecting concerns regarding scenic, aesthetic, historic, and environmental resources.</td>
<td>Transportation Policy Plan</td>
<td>State</td>
<td>Automobile, Bicycle, Pedestrian, Transit</td>
<td>N/A</td>
<td><a href="http://www.extranet.vdot.state.va.us/docs/electronic%20pubs/iim/IIM235.pdf">http://www.extranet.vdot.state.va.us/docs/electronic%20pubs/iim/IIM235.pdf</a></td>
<td>Instructional and Informational Memorandum dated August 2008.</td>
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<tr>
<td>Virginia General Assembly</td>
<td>Urban Development Areas (Code of Virginia Section 15.2-2223.1)</td>
<td>The amendment requires high growth localities to designate Urban Development Areas (UDAs) in their comprehensive plans. UDAs will be areas of compact development that incorporate principles of new urbanism and traditional neighborhood development. Encouraging well-designed development and growth in these areas will help reduce trip lengths, encourage trips by other modes, and foster more sustainable development patterns.</td>
<td>Virginia Legislation</td>
<td>State</td>
<td>Automobile, Bicycle, Pedestrian, Transit</td>
<td>N/A</td>
<td><a href="http://leg1.state.va.us/cgi-bin/legp504.exe?000+cod+15.2-2223.1">http://leg1.state.va.us/cgi-bin/legp504.exe?000+cod+15.2-2223.1</a></td>
<td>General Assembly added to Code of Virginia in 2007.</td>
</tr>
<tr>
<td>Virginia Department of Transportation</td>
<td>Secondary Street Acceptance Requirements</td>
<td>These regulations incorporate the design and function of a street as criteria for acceptance into the state system of roads. Developers must build streets that connect with the surrounding transportation network in a way that enhances the capacity of the overall transportation system and accommodates pedestrians, as determined by the area type.</td>
<td>Transportation Policy Plan</td>
<td>State</td>
<td>Automobile, Bicycle, Pedestrian</td>
<td>The state is divided into three categories based on long-term local, regional and federal planning boundaries: compact, suburban, and rural.</td>
<td><a href="http://www.virginiadot.org/projects/ssar/default.asp">http://www.virginiadot.org/projects/ssar/default.asp</a></td>
<td>Approved in February 2009.</td>
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<tr>
<td>Virginia Department of Transportation</td>
<td>Chapter 527 Traffic Impact Analysis Regulations</td>
<td>This regulation requires localities to submit a traffic impact analysis (TIA) to VDOT for development proposals that would significantly impact the state transportation system during comprehensive plan amendments, rezonings and site plan approvals. Amendments to the regulations require VDOT to approve a trip generation methodology for urban developments and small area plans that recognizes the reduced vehicle trip generation of mixed use, compact development patterns and transportation demand management measures.</td>
<td>Transportation Policy</td>
<td>State, Local</td>
<td>Automobile, Bicycle, Pedestrian, Bus</td>
<td>N/A</td>
<td><a href="http://www.virginiadot.org/projects/chapter527/default.asp">http://www.virginiadot.org/projects/chapter527/default.asp</a></td>
<td>Established in 2006 and amended in 2010.</td>
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<tr>
<td>Virginia Department of Transportation</td>
<td>Access Management Regulations and Standards</td>
<td>These regulations define standards for design of intersections and entrances to reduce conflict points and enhance vehicular and pedestrian circulation. The regulations attempt to balance efficient highway operation and reasonable property access.</td>
<td>Transportation Policy</td>
<td>State, Local</td>
<td>Automobile, Bicycle, Pedestrian</td>
<td>Spacing standards vary by functional classification (urban or rural, arterial or collector)</td>
<td><a href="http://www.virginiadot.org/projects/accsmgt/default.asp">http://www.virginiadot.org/projects/accsmgt/default.asp</a></td>
<td>Effective July 2008 for Principal Arterials and October 2009 for Minor Arterials, Collectors and Local Streets.</td>
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<tr>
<td>Virginia Office of Intermodal Planning and Investment</td>
<td>VTrans2035 and the Virginia Surface Transportation Plan</td>
<td>VTrans2035 is Virginia’s long-range multimodal transportation plan. VTrans2035 acknowledges the changing circumstances and growth pressures that are increasing the demand for transportation choices and the mobility needs of all residents. The Virginia Surface Transportation Plan (VSTP) follows the policy guidance of VTrans2035 and identifies specific multimodal solutions for Virginia’s different regions, including public transportation strategies, rail investments and highway improvement projects.</td>
<td>Transportation Policies</td>
<td>State</td>
<td>Automobile, Bicycle, Pedestrian, Public Transportation, Rail</td>
<td>N/A</td>
<td><a href="http://www.vtrans.org/">http://www.vtrans.org/</a></td>
<td>Completed in 2010.</td>
</tr>
</tbody>
</table>