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PURPOSE AND NEED

1.1 STUDY AREA

The Virginia Department of Transportation (VDOT), in cooperation with the Federal Highway Administration (FHWA), is studying transportation problems and potential solutions in the southeastern Harrisonburg metropolitan area between U.S. Route 11 and U.S. Route 33. **Figure 1-1** shows the study area location and boundaries. These boundaries are based on the transportation needs to be addressed in the study, namely, east-west mobility and accommodation of travel demand arising from development in the study area. The study area boundaries are defined generally by major transportation routes and correlate to boundaries used in local and regional land use and transportation plans. The study area encompasses a small portion of the City of Harrisonburg and a sector of Rockingham County southeast of the city limits that the county's government has designated for development.

The western boundary lies along U.S. Route 11, a major arterial route parallel to and just west of Interstate Route 81 (I-81). Route 11 serves primarily local travel between the Town of Mount Crawford and the City of Harrisonburg and provides access to residential and employment centers along Route 11. I-81 serves both long-distance and local travel (via four interchanges with other roads). The southern boundary lies just south of Route 682, a secondary road connecting I-81 and Virginia Primary Route 276. Route 682 is the southern boundary of the regional study area for the Harrisonburg-Rockingham Metropolitan Planning Organization (HRMPO) and the southern urban growth boundary in the county's comprehensive plan. The eastern boundary lies just east of Route 276, which is the eastern boundary of HRMPO's study area and is just outside the county's urban growth boundary. Lands farther south and east are outside the county's designated urban growth boundaries and therefore are not expected to contribute greatly to increases in travel demand across the study area. The northern study area boundary runs northeast of U.S. Route 33, another major arterial serving towns and cities in the Harrisonburg region and beyond. Lands in the northeast sector between U.S. Route 33 and I-81 north are not designated by the county's government for intensive growth and development.

1.2 HISTORY

This study arose out of a perceived need on the part of local officials and legislators for a connector road across the study area between I-81 and U.S. Route 33. A conceptual alignment for such a connector road was contained in the regional transportation plan, known as the Harrisonburg Area Transportation Study (HATS), developed in the 1990s and adopted by city and county governments. Funding for a location study was included in the Virginia Transportation Act of 2000 by the Virginia General Assembly and in the Six-year Improvement Program by the Commonwealth Transportation Board.

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STUDY AREA
Figure 1-1

1.3 NEEDS

A detailed analysis of transportation needs in the study area has been documented in the *Purpose and Need Technical Memorandum*, which is available for review upon request. The following sections outline the two principal needs to be considered in this Harrisonburg Southeast Connector Location Study: east-west mobility and accommodation of increasing travel demand arising from existing and future development in the study area.

1.3.1 East-west Mobility

Mobility is the ability to travel freely from place to place. It implies relatively unimpeded movement over relatively direct links in the transportation system. Direct east-west links across the study area to connect major activity centers and major highways are limited. **Figure 1-2** illustrates the generalized east-west travel pattern being addressed in this study. If one envisions Routes 11 and 81 along the west side of the study area and Route 33 along the northeast side of the study area as the legs of an "A," the crossbar of the A is missing. Most existing roads across the study area are secondary roads that are narrow, winding, hilly, and discontinuous - some are dirt roads little more than one lane wide. Travel across the study area from Route 11 or I-81 to Route 33, as well as travel among activity centers in the study area, is hampered by low speeds (because of poor road geometry), stops at intersections, and turns due to discontinuities in the routes. As development continues in the study area, and the number and extent of activity centers continue to grow, and the volume of travel among activity centers and major roadways continues to grow, mobility will become increasingly deficient.

1.3.2 Accommodate Travel Demand

While much of the study area is rural farmland today, Rockingham County's comprehensive plan designates most of the study area for residential, commercial, and industrial land uses, and proposes extensions of water and sewer services to serve that growth.[1] Section 3.2 in Chapter 3, Affected Environment, of this Environmental Impact Statement provides information on development patterns and planned growth. Agricultural and other undeveloped lands are expected to transform into developed areas. This transformation already has occurred in areas close to Harrisonburg, along principal travel routes, and along some secondary roads. Both population and employment in the study area are forecasted to grow approximately 77% by 2030, and the number of households is expected to grow 120%.[2] Travel demand across the study area will grow along with population growth and development.

HRMPO's regional travel model can be used to estimate future traffic volumes on the existing road network. **Figure 1-3** shows these forecasted volumes for the year 2030, along with 2003 volumes to illustrate the expected growth in traffic. Current traffic volumes on Routes 276, 680, 689, 704, and 710 (which generally serve as east-west routes across portions of the study area) crossing an imaginary line running roughly parallel to and just west of Port Republic Road (Route 253) amount to approximately 14,000 vehicles per day. By 2030, that volume is forecasted to grow to approximately 24,000 vehicles per day.

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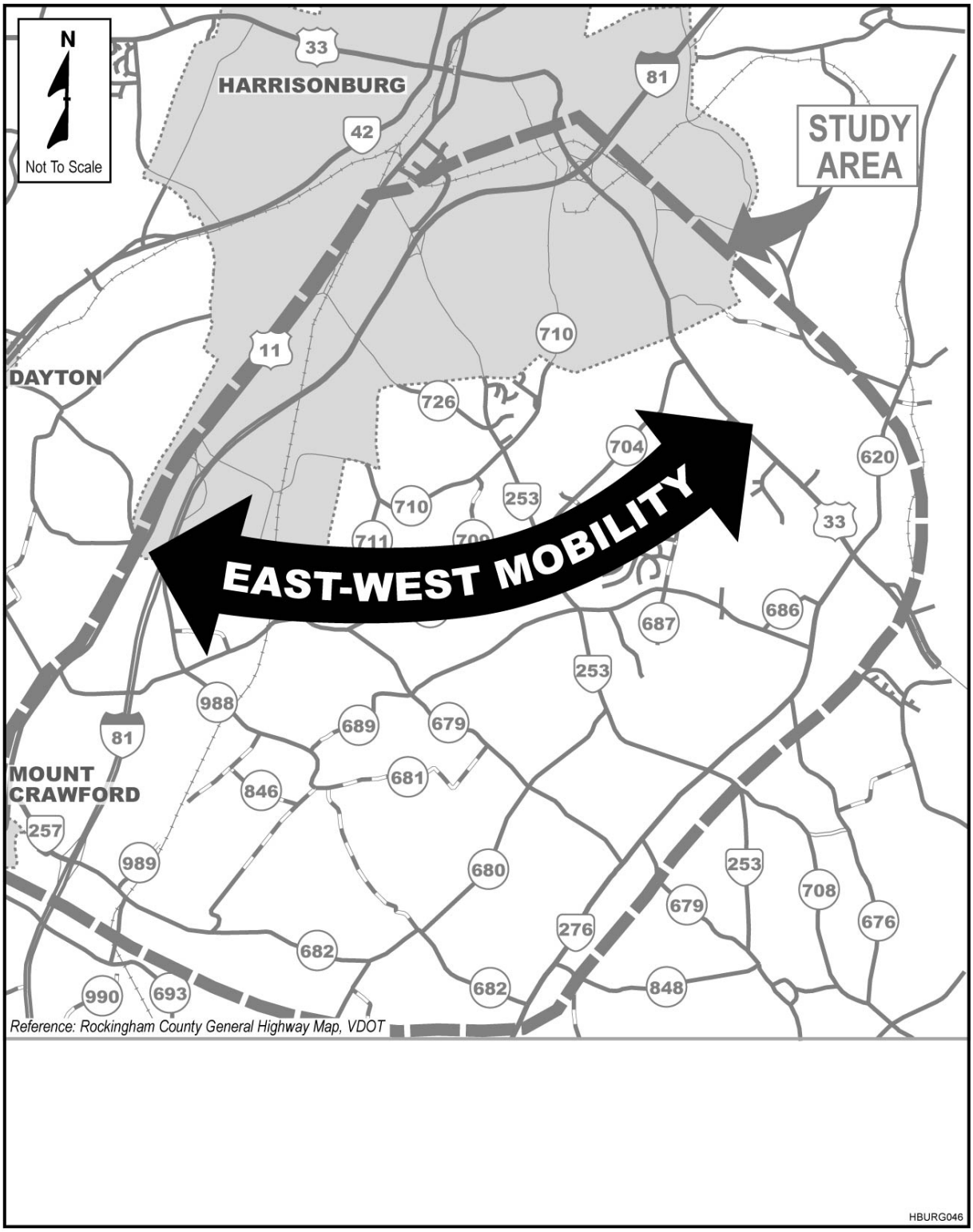
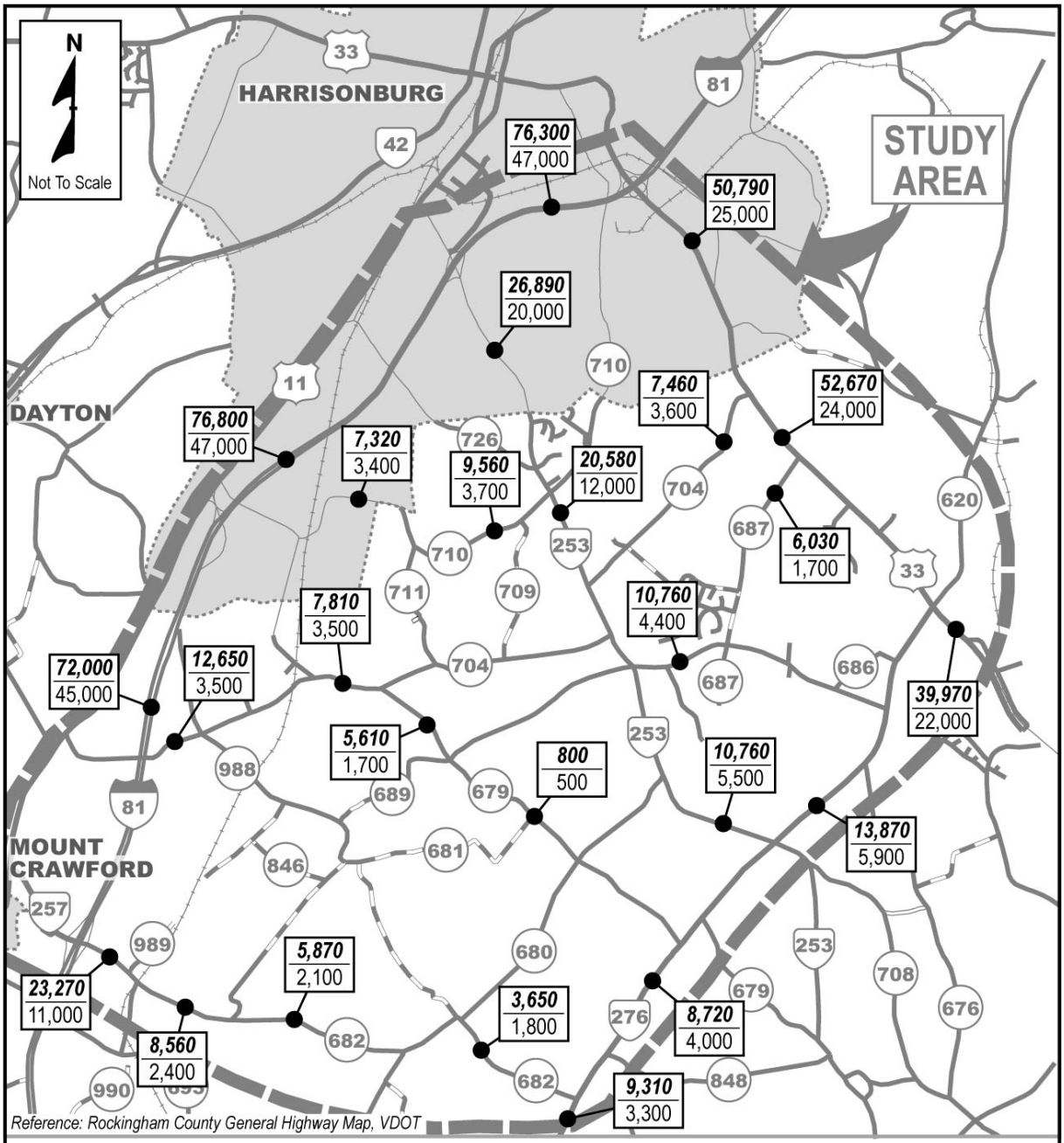
[1] Rockingham County's planners and Board of Supervisors seek to steer ongoing population growth into areas relatively close to Harrisonburg or other concentrations of existing development that are served by public water and sewer services, rather than have it scattered across the county. *Comprehensive Plan for 2020 and Beyond*, p 2-2.

[2] Number of households growing more than population because of expected decline in persons per household.



Harrisonburg Southeast Connector Location Study

EAST-WEST MOBILITY
Figure 1-2



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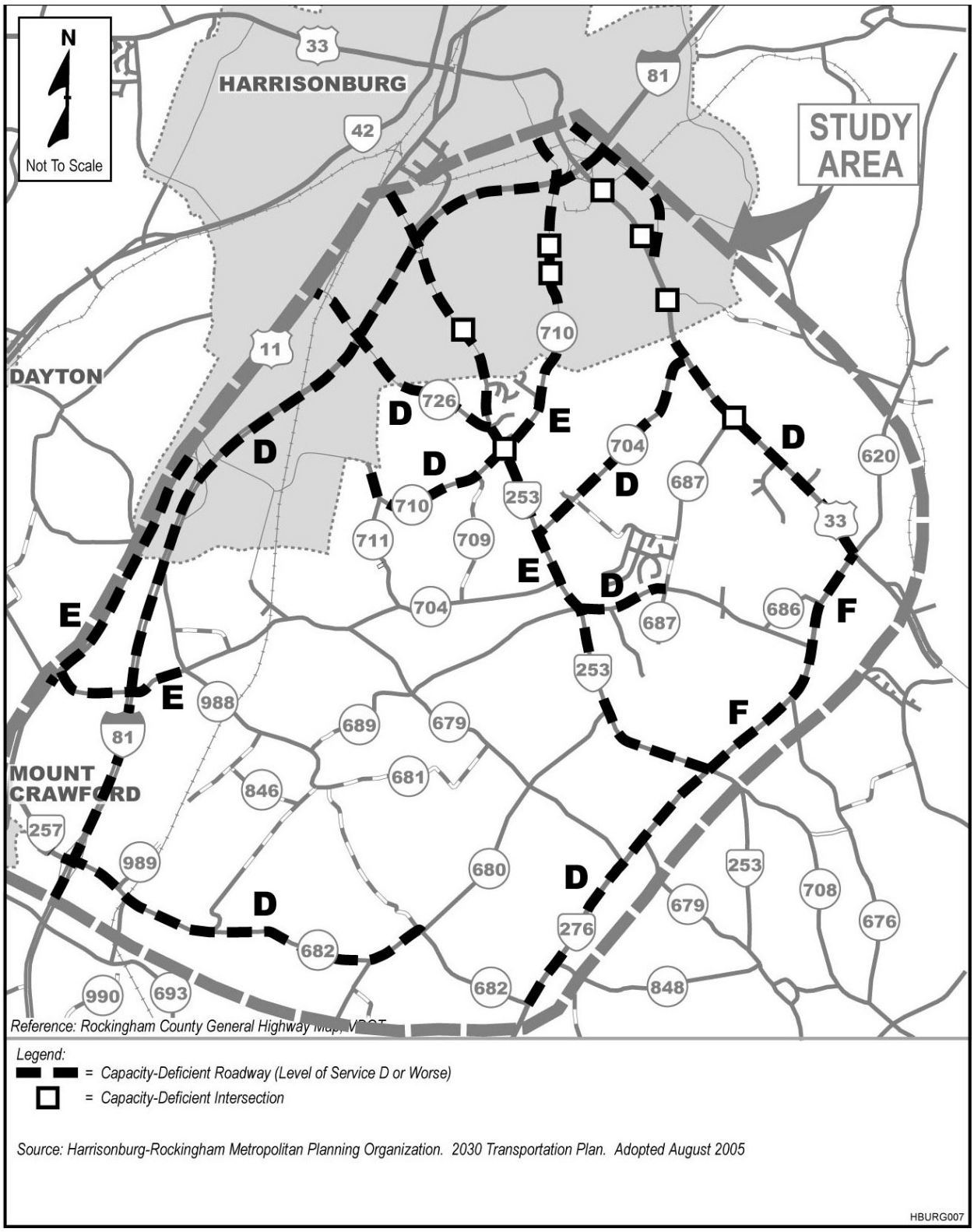
EXISTING AND PROJECTED TRAFFIC VOLUMES
Figure 1-3

The capacities of existing roads are not adequate to handle the projected volumes. A highway's capacity (i.e., the volume of traffic the highway can carry) is dependent on its physical configuration, number of lanes, types of traffic controls (e.g., stop lights or stop signs), and other factors. When traffic volumes exceed capacity, traffic flow breaks down, speeds decrease, and delays occur. **Figure 1-4** shows the roads and intersections that have insufficient capacity to handle projected volumes at an acceptable level of service by 2030.[3] Some of these deficiencies reflect problems relating more to north-south travel than east-west travel (e.g., on I-81, Route 253, and Route 710 east of Route 253). However, some fraction of these deficiencies can be attributed to the lack of adequate east-west connections between U.S. Route 11/I-81 and U.S. Route 33. Some motorists are using these routes because satisfactory alternative routes are not available to cross the study area. The deficiencies along Routes 682, 276, 704 in the vicinity of I-81, 710 and 726 west of 253, and 689 and 704 east of 253 more directly reflect the lack of adequate east-west routes. HRMPO's *2030 Transportation Plan*, which is the financially constrained long-range transportation plan for the region, prioritizes construction funding for the portion of the plan within the study area to address the deficiencies on Routes 682, 726, 253, and 33 (see Section 2.4, No-build Alternative, discussion in Chapter 2).

1.4 PURPOSE SUMMARY

In summary, the purpose of the Harrisonburg Southeast Connector Location Study is to evaluate alternatives to serve east-west mobility needs and existing and future travel demand in the study area. These needs are attributed to the lack of adequate east-west travel routes connecting principal arterial routes and major activity centers, and to the increasing traffic volumes generated by existing and forecasted development in the study area.

[3] Traffic operations on highways are quantified using level of service methodologies from the *Highway Capacity Manual* (HCM). The HCM provides standards used in the traffic engineering profession to rate operations using a scale from A to F, with A representing excellent traffic flow with minimal delays and F representing failure in traffic operations and very high levels of delay. Factors used in estimating levels of service include functional classification of the highway, terrain, truck percentages, lane widths, extent of no-passing zones, number of access points, and amount of delay at intersections. For most of Virginia, including the Harrisonburg region, VDOT considers levels of service **A, B, or C acceptable** and levels of service **D, E, or F deficient**.



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CAPACITY-DEFICIENT ROADWAYS
Figure 1-4