



**Virginia's Long-Range Multimodal  
Transportation Plan  
2007-2035**

**INSTITUTIONAL CHANGES IN  
TRANSPORTATION DECISION  
MAKING**

**Prepared for:  
Office of Intermodal Planning and Investment  
October 2009  
Prepared by:  
John Miller  
Virginia Transportation Research Council**

## TABLE OF CONTENTS

<b>ABSTRACT</b> .....	2
<b>INTRODUCTION</b> .....	3
<b>PURPOSE AND SCOPE</b> .....	3
<b>METHODOLOGY</b> .....	4
<b>RESULTS AND DISCUSSION</b> .....	4
Possible Changes in Decision Authority.....	4
Decisions at the Multi-State Level.....	4
Decisions at the Regional Level .....	6
Decisions at the Local Level.....	8
Perceived Advantages and Disadvantages of these Changes in Decision Making.....	9
Perceived Advantages of Devolution.....	9
Perceived Disadvantages of Devolution .....	11
Historical Tradeoffs Between Advantages and Disadvantages of Devolution.....	13
Case Study: Changes in Decision Making that Might Affect Access Management of the Secondary System.....	14
Mechanisms Affected by One Change in Decision Making.....	15
Potential Threat: Degraded Access Management on Secondary Facilities .....	15
Potential Solutions to Encourage Better Access Management on Secondary Facilities..	18
<b>POTENTIAL FUTURE RESEARCH STEPS</b> .....	20
<b>CONCLUSIONS</b> .....	21
<b>REFERENCES</b> .....	22

## ABSTRACT

The Commonwealth's infrastructure investments are increasingly determined within several organizational structures besides the Virginia Department of Transportation (VDOT). These institutions include inter-state coalitions (e.g., the I-95 Corridors of the Futures Program or Metropolitan Planning Organizations (MPOs) that span two or more states), intra-state coalitions such as some MPOs located solely within Virginia or the Virginia Railway Express (VRE), and localities (e.g., the Urban Construction Initiative which enables willing municipalities to take responsibility for delivering the VDOT construction program). This increased sharing of decision authority suggests the possibility of future growth in tiered planning, where different types of transportation planning are performed at different administrative levels. For example, one possible future is a Virginia where some localities play a greater role in management of the secondary system and collaboration with adjacent states influences the management of I-95.

The literature cited in this paper gives advantages and disadvantages of shifting responsibilities from higher to lower levels of government. Advantages are described as (1) lower overhead costs associated with project delivery by a more local entity (Whitley, 2006); (2) the integration of regional comprehensive long range planning with regional project delivery (Hoefl, 2007); and (3) greater accountability to issues of local concern (Seefeldt et. al., 1987; Joint Legislative Audit and Review Commission [JLARC], 1992). Disadvantages are given or implied as (1) the tendency for operations to dominate longer-term planning when both are housed in the same entity (Kozlak, 2007); (2) greater difficulty in terms of achieving network benefits, since some links of the transportation network may provide greater benefits to the system as a whole than to the area where the link is located (Giuliano, 2007); and (3) inconsistent operational or maintenance practices throughout the transportation network (JLARC, 1987).

Assuming that the shifts of decision making authority noted in this paper continue, Virginia may wish to explore two approaches to counter disadvantages that others have noted. One approach is to provide clear financial incentives for localities or regions to collaborate when such collaboration is in the best interest of the state transportation system. The second approach is to identify which components of the system have state rather than only local benefits.

## **INTRODUCTION**

Decisions about the quantity, type, and location of Virginia's transportation investments have historically been made at multiple levels of government. The General Assembly establishes the state fuels tax, and the Commonwealth Transportation Board (CTB) allocates funds to specific projects through the Six Year Improvement Program (SYIP). Counties and cities influence investment decisions through their role in selecting projects that are placed in the secondary and urban components of the SYIP, respectively (VDOT Local Assistance Division [LAD], 2009a). Metropolitan Planning Organizations (MPOs), which are regional policy-making bodies composed of local representatives and state transportation authorities in areas with a population of at least 50,000, influence investment decisions through the development of the MPO's Transportation Improvement Program (TIP): projects must be in the MPO's TIP in order to receive federal funding. (MPOs in Virginia are often staffed by planning district commissions PDCs, which also perform other transportation-related planning functions.)

However, the relative influence of state, regional, and local levels on Virginia's transportation investment decisions is not equal. For example, a national study reported that MPOs directly controlled approximately 7% of federal bridge and roadway funds authorized under the Transportation Efficiency Act of the 21<sup>st</sup> Century (TEA-21) which was the federal reauthorization in place from 1998 through 2003 (Puentes and Bailey, 2003), leaving more direct authority at the state level. The situation in Virginia appears to be similar to this estimate; for example, interviews with Richmond regional planning staff indicated that that area controls about 10% of the transportation-related funding for the region (Miller et. al., 2006).

Between now and 2035, it is quite possible that authority for transportation investments may change relative to the present case. Some of this change may be due to short-term or mid-term economic shifts: for example, the 35% decrease in the size of the 2010-2015 transportation program (relative to the program adopted a year earlier) "eliminated the state funding distributed to localities for their own use on secondary, primary, urban and unpaved road work" (Bacque, 2009). In the short term, such a cut reduces the ability of both the state and localities to implement new projects, and logically should reduce local authority over transportation investments even further due to the removal of local discretion. In the medium term, however, such cuts may reduce state authority as local funding sources become more prevalent. Other changes may be structural, longer term redistributions of authority such as the Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991 that gave MPOs greater influence over transportation investment decisions than they had had under prior federal reauthorizations.

## **PURPOSE AND SCOPE**

The purpose of this paper is to identify ways in which transportation decision making authority might change between now and 2035, to explore the potential implications of such changes, and to provide potential strategies for addressing such changes.

The scope of this paper is limited as follows:

- The paper identifies potential changes in decision making but does not prove they will occur.
- The paper identifies potential benefits and disadvantages of such changes but does not determine whether the net impact is positive or negative.

## **METHODOLOGY**

Three steps comprised the methodology used to develop this paper.

- *Literature suggesting how decision-making processes have recently shifted, or might shift in the near future, was reviewed.* Examples include proposed federal legislation regarding planning requirements, recent Virginia legislation, and decision-making trends in other states.
- *Literature citing strengths and weaknesses of decision making processes was reviewed.* Emphasis was placed on the rationale given for locating decision authority at the local, regional, and multi-state levels of government in contrast to the state level of government.
- *A case study examined how altering decision authority might affect secondary road access management.* The case study identifies possible risks to the transportation system and, based on lessons from the literature, ways to mitigate these risks.

## **RESULTS AND DISCUSSION**

### **Possible Changes in Decision Authority**

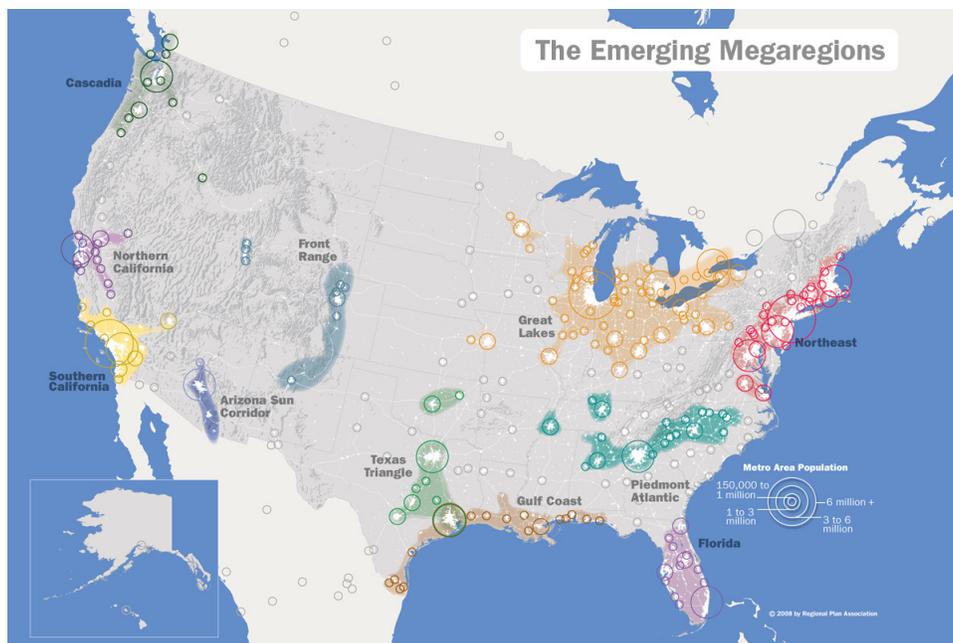
State transportation investment decisions may shift to, or be influenced by, three levels of government: multi-state, regional, and local.

#### **Decisions at the Multi-State Level**

Some decision authority may be shifted to the multi-state level. One recent example is Virginia's participation in the "Corridors of the Future" program where five states—Florida, Georgia, North Carolina, South Carolina, and Virginia—have agreed to coordinate improvements along the Interstate 95 corridor (Federal Highway Administration [FHWA], 2009; "Corridors of the Future Development Agreement," 2009). FHWA will distribute \$21.8 million among these states, which they will use to pursue three discrete endeavors: (1) consider if feasible the use of public private partnerships to minimize construction costs, (2) develop a consistent approach to Intelligent Transportation System (ITS) projects [a potential example may be consistent variable message signing along the corridor], and (3) develop consistent performance measures based on travel time and travel reliability along the corridor.

A second example of such inter-state coalitions is the Interstate 81 multi-state corridor initiative, where Maryland, New York, Pennsylvania, Tennessee, Virginia, and West Virginia signed a Memorandum of Understanding (“Memorandum of Understanding,” 2009) to collaborate on highway and rail improvements. For example, each state agrees to “coordinate I-81 region freight truck and rail study planning, assumptions, and technical analyses.”

The idea of multi-state partnerships is not new and in fact has been suggested as an essential instrument for achieving a particular transportation goal. Roth and Aggarwala (2002) described the National Passenger Railroad Corporation’s rail service (Amtrak) from Boston to Washington, D.C., as a “regional” asset managed at the national level. Since the authors believed that national funding was unlikely to be sufficient, they advocated the formation of a multi-state partnership to support Amtrak. Such multi-state areas have also been described as a “megaregion,” which Amekudzi et al. (2007) define as “a contiguous area that comprises multiple major cities or megacities.” Figure 1 shows ten megaregions that have been identified in the U.S. Virginia is included within one such megaregion—the Northeast megaregion, which captures between 28% and 65% of Virginia’s population depending on whether the southern terminus is Northern Virginia, Richmond, or Hampton Roads.



**Figure 1. Megaregions in the United States.** Picture is courtesy of the Regional Plan Association, *America 2050: A Prospectus*, New York: September 2006. [www.america2050.org/pdf/America2050prospectus.pdf](http://www.america2050.org/pdf/America2050prospectus.pdf). Accessed August 25, 2009. Used with permission. Image URL is: <http://www.rpa.org/america2050/sync/elements/america2050map.png>

Amekudzi et al. (2007) suggest that transportation planning processes will undergo four changes as the population, and hence importance, of these megaregions grow:

- Use a longer planning horizon of approximately 40 years [as opposed to the more conventional 20-25 year period] will be used to better account for the impacts of sustainability, such as transportation-land use interactions.
- Use of a tiered planning process where planning is conducted at multiple levels of government, such as the traditional regional planning process for urban metropolitan areas coupled with megaregional planning for multi-state initiatives.
- A continued reduction in the tax base. [For example, in 2009 the proportion of persons age 65+ was a bit more than 12% whereas in 2035, it is expected to be 19% in Virginia (NPA Data Services, Inc., 2008).]
- A broader geographic scope to address multi-state issues such as intercity passenger rail improvements that require coordination across state boundaries.

Finally, while MPOs are often viewed as regional entities, three Virginia MPOs may be considered multi-state entities. These are the National Capital Region Transportation Planning Board (which is staffed by the Metropolitan Washington Council of Governments and which serves the District of Columbia, suburban Maryland, and Northern Virginia), the Kingsport MPO (which represents Kingsport Tennessee along with Gate City, Scott County, and Weber City in Virginia), and the Bristol MPO (which represents, in addition to Bristol Tennessee, the Virginia city of Bristol and county of Washington) (Albright, 2008; Bristol MPO, undated[a]). These MPOs influence decision making in that, as is the case with specific projects must be included in the MPO's Transportation Improvement Program (TIP) to receive federal funding and these MPOs may develop MPO-specific criteria to select projects for inclusion in the TIP. For example, the Bristol MPO awards 10 points (out of 100 maximum) for projects that support an alternative mode (Bristol MPO, undated[b]).

## **Decisions at the Regional Level**

One type of regional organization is the MPO. In the near term, some additional requirements and additional funding opportunities are envisioned for larger MPOs. The House of Representatives proposal for the next federal surface transportation authorization program specifies that MPOs larger than 1 million people must include in their transportation plans the performance measures required for MPOs under one million people (e.g., congestion, safety, and emissions), but they must also measure some very specific items, such as housing supply for all income levels, land use patterns supporting reduced single occupant auto trips, and water conservation, as shown in Table 1. Such indices are consistent with the suggestion by Amekudzi et al. (2007) that in very large areas, the manner in which transportation performance is assessed will evolve to include "congestion indices, air quality, safety, relocation desirability for businesses, and quality of public health."

**Table 1. Proposed Performance Measures for MPOs<sup>a</sup>**

MPO population < 1,000,000	MPO population > 1,000,000
<ul style="list-style-type: none"> <li>• Congestion</li> <li>• Safety</li> <li>• Emissions</li> <li>• Energy consumption</li> <li>• Consistency with land use plans</li> </ul>	PMs shown on the left and <ul style="list-style-type: none"> <li>• Land use patterns supporting reduced single occupant auto trips</li> <li>• Housing supply for all income levels</li> <li>• Impacts on farmland and natural resources</li> <li>• Greenhouse gas emissions</li> <li>• Water and energy conservation</li> <li>• Livability of communities</li> </ul>

<sup>a</sup> Source: U.S. House of Representatives, Committee on Transportation and Infrastructure (2009a,b).

The proposed legislation also establishes an extra source of funds (the Metropolitan Mobility and Access Program) which is available to MPOs serving an urbanized area in excess of half a million people (Fischer et al., 2009). [Ten MPOs over a million people will receive 40% of the program’s funds; the remaining MPOs who do not receive such a grant and half population in excess of half a million will be eligible for grants from the remaining portion of the program.]

The literature highlights two strengths of MPOs. One is that the MPO brings diverse local interests together: Mason (2008) notes that “as local jurisdictions become major revenue sources, the potential for fragmentation or balkanization of state and regional transportation systems increases.” Pedersen and Morris (2007) argue that technical expertise will define the power of future MPOs, noting that “the most successful MPOs of 2020 will be those deriving their authority and relevance by adding value to the most important issues of the day, rather than relying primarily on federal regulations for their authority.” The fact that authority can be derived from technical expertise is not new: Hazard (1988) argued that such expertise was one of six critical ways that federal agencies accrue power (the other methods relating to federal mandates, resources, organizational efficiency, access to decision makers, and ability to work with advocacy groups or stakeholders.)

Yet with the exception Portland (Oregon) where the region has constitutional authority equivalent to a city or county (McKenzie, 2007), MPOs’ authority is limited to what can be achieved through consensus with localities and states. Ross et al. (2008) state that “A well-managed, well funded, and well-regarded MPO can incorporate regional needs into local transportation planning. Yet most MPOs must still answer to local political forces which may not be willing or able to advocate regional policies.” This limitation of MPOs to act regionally had also been noted prior to the passage of ISTEA, when Menchik (1987) explained that while “MPOs can serve as a valuable forum for state-local, local-local, and intrastate communication and plan making, they generally cannot by themselves ‘reconcile’ diverse interlocal goals and priorities.”

Accordingly, it is not surprising that when an MPO lacks strong central authority, regional planners have developed ways to still accomplish some regional planning. For example, Moscovich (2008) identified three “coping mechanisms” used in the San Francisco Bay area whose localities have different characteristics—urban, suburban, and rural—and consequently different priorities. Each county sets its own priorities for project selection; for example, each county might identify the most congested areas rather than selecting the regionally most cost-

efficient projects. Additionally, “tactical” agreements (e.g., those where jurisdictions cooperate explicitly to obtain state or federal funds) are pursued rather than “strategic agreements.” [While strategic agreements are not explicitly defined in Moscovich (2008), they are presumably initiatives that benefit the entire region; an example of a strategic agreement for the entire region is given by the U.S. Government Accountability Office (2004) as an extension of two rail systems that increases the accessibility of an international airport for the entire region]. Finally, smaller scale initiatives are pursued, such as guaranteed ride home programs, restoration of abandoned transit service, and “vans to connect senior centers to transit stations” (Moscovich, 2008).

A fourth mechanism for addressing a lack of regional power is the creation of local or regional authorities. Examples are county metropolitan authorities in California (which are funded by up to a 1 cent sales tax) or San Diego’s Transnet program, which is a regional authority that uses a ½ cent sales tax to fund a \$14 billion (40 year) transportation program, with funding split three ways: for regional freeways, transit, and localities (McKenzie, 2007).

A Virginia-specific example of a non-MPO regional entity is the Virginia Railway Express (VRE). The VRE is owned and operated itself by two different transit-oriented commissions: the Northern Virginia Transportation Commission (which represents Alexandria, Arlington, Fairfax (City and County), Falls Church, and Loudon and the Potomac and Rappahannock Transportation Commission (which represents Fredericksburg, Manassas, Manassas Park, Prince William and Stafford) (VRE, 2009a). The commissions have delegated an increasing amount of operational decision authority to an Operations Board that represents each jurisdiction and weights voting decisions in a manner proportionate to the subsidy provided by each jurisdiction (VRE, 2009b). (Overall these jurisdictions provide about 15% of the operating revenue, with passenger, state, and federal sources providing 23%, 27%, and 33% respectively). Thus the VRE may be viewed as a regional entity that exists to achieve a specific objective, which in this case is the provision of commuter rail service.

## **Decisions at the Local Level**

Virginia has chosen to facilitate the devolution of several transportation-related decision powers from the state level to the local level.

Legislation enacted in 2001 (§33.1-84.1 of the *Code of Virginia*) allows counties to assume responsibility for secondary road functions that have previously been performed by the state. (“Secondary” is an administrative designation and generally refers to roadways numbered 600 and above.) Counties may take over (1) construction only, (2) maintenance only, (3) construction and maintenance, or (4) construction, maintenance, and operations of their secondary system (VDOT LAD, 2007). If a county takes over operations as per option (4), it has the potential to fundamentally alter the service characteristics of the system as the county would control both access permits for driveways and connections to the subdivision street network. At this point, the impact of this legislation is unclear as no counties in Virginia have decided to participate. Note that option (4) would be similar to the arrangement with Arlington and Henrico Counties—the only two counties at present that construct, operate, and maintain their own

facilities and which never joined the state system when the Byrd Act provided the counties with this option in 1932 (Forrest, 2005).

A second example of devolution is VDOT's Urban Construction Initiative, also known as the "First Cities" initiative. Section 33.1-23.3(D) of the *Code* allows Virginia cities and towns to assume delivery of their entire VDOT construction program, regardless of whether these projects are state or federally funded. As of 2009, seven cities (Charlottesville, Colonial Heights, Hampton, Harrisonburg, Lynchburg, Richmond, and Virginia Beach) and three towns (Blacksburg, Bridgewater, and Dumfries) have elected to participate (VDOT LAD, 2009b).

Other instances of devolution are local takeovers of specific facilities. The largest takeover has been by the City of Suffolk, which has assumed responsibility for its primary and secondary systems which were previously managed by VDOT: these systems include 1,490 lane miles and 50 traffic signals and reflect maintenance costs of approximately \$16 million per year (Bacon, 2006). [In 1972 Nansemond County and two other towns became Nansemond City, which in 1974 merged with the City of Suffolk (Virginia Association of Counties, 2009). Since that time, however, the roads located in what had been old Nansemond County had been treated as secondary facilities and were under VDOT control (VDOT, 2000) until they were taken over by the City of Suffolk in 2006.] At the other end of the spectrum, the Albemarle County Board of Supervisors has allocated \$9,300 to VDOT for a three month period for VDOT to continue running Albemarle's Hatton Ferry (Shulleeta, 2009); previously VDOT funded the ferry at no cost to the county until budget pressures led VDOT to propose cutting the service entirely, at which point the County offered the funding.

### **Perceived Advantages and Disadvantages of these Changes in Decision Making**

The literature cites benefits and drawbacks of these institutional changes as discussed in the subsections that follow. For each of these examples, it is possible that additional information or more detailed study could strengthen or weaken the benefit or drawback that is shown; the utility of these subsections is that that illustrate why changes in decision structures have appeal to various stakeholders.

#### **Perceived Advantages of Devolution**

The literature gives benefits of transferring decision authority to localities; for example, the City of Hampton cites its receipt of interest from payments received for the state portion of the urban construction program and greater responsiveness to local priorities (provided the project is in the SYIP, the Regional Transportation Plan, and the City's Capital Improvement Plan) as motivations for participating in the Urban Construction Initiative (Whitley, 2006). Overall, though, the literature that supports devolution attributes three reasons for this support.

##### *Perceived Advantage 1. Greater Local Efficiency*

One reason is an increase in efficiency that results from local administration of a project. Whitley (2006), for example, notes that the Urban Construction Initiative is beneficial due to a reduction in overhead costs; this reduction comes from both reduced staff time and an ability to customize local solutions. As another example, Seefeldt et. al. (1987) noted that greater local involvement with project delivery could enable the use of certain processes by locales, such as the use of condemnation authority, to accelerate project delivery. Perhaps a quote from Whitley (2006) best captures the spirit of expecting greater efficiencies from devolving project delivery to local governments:

VDOT, because they are operating on a statewide basis, has a uniform set of guidelines, standards and rules that may not be applicable on every project, and localities feel that several of these processes can be shortened or eliminated in order to expedite the design and construction of the project.

An August 18 editorial in *The Washington Post* (“Street sense in Arlington,” 2009) argued that operational responsibilities for Arlington’s Route 244 (Columbia Pike) should be given to the County because of large delays associated with simple improvements (e.g., 4 years for the addition of a crosswalk). By extension, the editorial noted that if these improvements were difficult to achieve under VDOT control, then one could only imagine what would occur if the same Department were responsible for proposed streetcar implementation along Route 244.

#### *Perceived Advantage 2. Greater Ability to Link Planning with Operations and/or Land Use*

A second motivation for devolution appears to be the placement of operational decisions and transportation planning responsibilities within the same entity. For example, consider a locale that assumes construction, maintenance, and operational responsibilities for its secondary street system. This locale now has the authority to accept subdivision streets into its secondary system as well as grant access permits for those facilities. Because the same entity is now responsible for managing the costs of those facilities, the locale has an incentive to ensure that these local streets are built to high standards, are interconnected in such a way to minimize the impact on other secondary facilities, and have well managed access.

Further, because Virginia localities influence the land development function to a greater degree than VDOT (through zoning and subdivision ordinances), a locale that also operates its secondary street system influences, *to some degree*, land use driven demand for this network. (The reason for the qualifier is that no locale can ever have complete land development authority as such development can occur only when supported by the market. Further, for areas where the market supports land development, localities have some instruments that can shape this growth, such as conditional zonings and impact fees, but in Virginia these instruments have limitations. For example, impact fees (which are levied at the time a building permit is issued) can only be applied in jurisdictions meeting certain population criteria (e.g., they may be used in Culpeper County but not Madison County) and require a substantial number of administrative steps that, in the past, have limited their application [Herd et. al., 2008]).

Outside Virginia, other agencies have noted benefits of integrating transportation planning and transportation operations. For example, since 2004, the Las Vegas MPO has operated the Freeway Arterial System of Transportation (FAST): this linkage of operations (e.g.,

the traffic management associated with FAST) with planning (e.g., the traditional transportation planning performed by the MPO) has enabled the MPO to be more responsive to citizen suggestions (such as signal retiming) and to locally elected officials (Hoeft, 2007). Similarly, Minnesota's Metropolitan Council (which is the MPO for Minneapolis/St. Paul) has responsibility for operating bus service and light rail transit service as well as transportation planning. This consolidation of transit operations and MPO transportation planning provides better integrated planning that is more likely to be implanted (Kozlak, 2007) given that that sewer and land use planning can support the transportation planning function.

### *Perceived Advantage 3. Greater Local Responsiveness*

Several articles have noted that greater local involvement can lead to local governments being more directly accountable to citizens. Examples include the use of "quick-take" condemnation authority which may be exercised by local governments (Seefeldt, 1987), the ability to protect local neighborhoods from the threat of through truck traffic (JLARC, 1992), and an ability for local staff to respond immediately to citizen complaints regarding a specific project (Whitley, 2006). A similar advantage has been noted when decentralizing decision authority within an organization. For example, a review of the Texas Department of Transportation noted that providing substantial authority to district offices (rather than centralizing decisions at the headquarters level) enabled a sharp customer focus and allowed for "timely and least expensive access, contact with the public, and knowledge of local conditions." (Rylander, 2001).

### *Summary of Advantages Attributed to Devolution*

Several examples of decentralized decision making have been described: Virginia's ability to devolve portions of the secondary system to localities, Virginia's Urban Construction Initiative, and instances of a single entity integrating the planning and operations function as noted in Hampton (Virginia), Las Vegas (Nevada), and the Twin Cities (Minnesota). Literature supporting such a decentralized model suggest it is advantageous due to increased efficiencies that accrue when the project (1) is delivered by a local entity that (2) can integrate delivery with planning, operating, or land use responsibilities; other proponents have noted a third reason which is enabling local governments to be more responsive to citizens.

### **Perceived Disadvantages of Devolution**

While the Twin Cities experience has been positive, Kozlak (2007) raises one concern regarding the integration of the planning and operations function in that "Operations can dominate planning," suggesting that possibly some longer-term strategic thinking may receive less attention in such a structure. Giuliano (2007) further argues that at the national level, the decision making structure for transportation is undergoing two changes that appear to mirror Virginia's recent initiatives: devolution of decisions from higher to lower forms of government and fragmentation [e.g., an increase in the number of decision making units such as special tax

districts]. Giuliano (2007) argues that these trends pose two distinct challenges for transportation: loss of network benefits and an inability to advance projects unless all adverse consequences are avoided.

*Perceived Disadvantage 1. Loss of network benefits.*

A transportation network reflects economies of scale that accrue from a series of interdependent connections. Similarly, if a needed improvement at location  $x$  is not implemented, such as a signal retiming, a shortened transfer between two modes of travel, or a roadway improvement bypassing a congested area, then the foregone performance improvement is felt throughout the entire transportation system—not just by those travelers who live or work near location  $x$ . Giuliano (2007) writes that “if all responsibility for the Interstate system were devolved to the states, individual states would have little incentive to maintain” underused segments such that the interstate system would not likely survive in its present form. In fact, Giuliano (2007) notes that the most recent reauthorization (SAFETEA-LU) “is a much weakened structure for stewardship of the National Highway System” citing as evidence the prevalence of earmarks and minimum percentages to states of donated highway funds, known as guarantees. Yusuf et. al. (2008) suggest that objective indicators of need (e.g., volumes, road conditions, future growth, or economic development impacts) are often “ambiguous or conflicting,” which contributes to a situation where issues of local concern may be weighted more heavily than the “general interest.”

Alonso-Biarge and Ortiz (2000) do not oppose devolution per se but note several practical difficulties in successfully transferring management responsibility for highway facilities from a national to a local entity, including (1) the large expense of maintaining these facilities, (2) their role in the national economy, and (3) the variation in management responsibilities for each type of road. Such responsibilities include not only engineering and maintenance but also financing, the establishment of policies for how the facility is to be operated, and determining the relative prioritization of the road given its contribution to the transportation network (Alonso-Biarge and Ortiz, 2000).

*Perceived Disadvantage 2. Projects are not built without full mitigation of adverse impacts and benefits for each entity.*

Broad social benefits are evident for a variety of local projects: adding a new freeway interchange yields regional economic development and investments in a rail system reduces freight transport costs. Whereas a single entity can presumably make a tradeoff between regional benefits and local disbenefits, the distribution of authority to a variety of smaller units means increases the number of adverse impacts that must be addressed. Giuliano (2007) cites as evidence Los Angeles’ rail transit program, noting that although only a few corridors could support rail transit, the decentralized structure of multiple jurisdictions and no strong regional authority meant that all jurisdictions needed some component of rail transit in order for a rail plan to move forward. Accordingly, Los Angeles emerged with an overly ambitious plan that resulted in several lines with insufficient demand, and, when such lines are built, a larger subsidy

than anticipated will be required. As another example, a local community may not have an incentive to invest in port improvements (U.S. Department of Transportation, Maritime Administration, 2005), even though such investments in capacity may reap national benefits. Consequently the “last mile” (e.g., the connection between the national highway system and the port) is particularly problematic and in some cases has taken over a decade to improve (U.S. Department of Transportation, Maritime Administration, 2005).

### *Perceived Disadvantage 3: Nonuniform Standards*

A third concern of devolution is that when the various components of a transportation system are managed by different decision making entities, travelers may perceive variation in the how the facility is operated. While these different decision making entities may be local jurisdictions, they may also be different functional units within the same organization. Bonneson et. al. (2009), for example, note that the delegation of traffic signal maintenance and operations procedures to individual DOT districts may lead to “operational inconsistencies and sub-optimal performance” which in turn could increase delays. The devolution in this case is within the state Department of Transportation, which suggests that devolution can occur without changing the structure of an organization but rather through altering the autonomy of units within that organization. O’Connell et. al. (2005) note that more consistent standards may be used to make capital investment decisions when a centralized state commission oversees project selection (where the commission is not comprised of elected officials). In terms of regional operation, High Occupancy Toll (HOT) lanes are an instance where a “centralized” rather than a “decentralized” governance structure is recommended in order to achieve greater consistency of design standards and operation (PB and ECONorthwest, 2007).

### *Summary of Disadvantages Attributed to Devolution*

Three disadvantages of devolving decision-making authority to lower levels of government have been noted in the aforementioned literature. These are the loss of network benefits where transportation improvements that primarily serve a statewide goal might not be emphasized by a local entity, the failure to complete projects that do not mitigate all adverse consequences, and nonuniform standards

## **Historical Tradeoffs Between Advantages and Disadvantages of Devolution**

This paper suggests that part of the devolution discussion is a tradeoff between the benefits of collective decision making that might achieve some regional good and the benefits of individual members being able to articulate their own priorities.

It may be argued that the 1932 Byrd Road Act (Vander Lugt and Virkar, 1991) adopted the former perspective in that what were formerly county roads were explicitly given a reliable funding source and implicitly were built to the same standard of design. JLARC (1993) notes that the Act “was designed to provide consistent construction, maintenance, and construction of

the State's roads and highways." A lasting impact of the Byrd Act—the focus placed on consistency of roadway design—is also evident in Bowman (1993) who chronicles notes highway commissioners “emphasized well-engineered highways that fit into the inter-city road scheme.” The federal-aid system also placed an emphasis on achieving certain design standards, not only for the interstate system but also for the state primary and secondary system. Bowman (1993) notes that until about 1985, the philosophy of building facilities to a given geometric standard in order to safely move intercity traffic volumes was paramount throughout the Department, especially with respect to the interstate system, noting further that

In Virginia, the most important effect of federal highway aid has not been a loss of autonomy in policy-making, but the centralization of highway policy-making with the Highway Department Central Office in Richmond (p. 53)

By contrast, the desire for locally tailored solutions is noted by Whitley (2006) which suggests that VDOT's “guidelines, standards and rules” may be shortened or modified on a case-by-case basis. At the national level, an emphasis on decentralization occurred during the 1980s at the federal level where in many areas—not just transportation—there was an impetus to give greater control for decision making to state or regional governments (Weiner, 1993). In Virginia, Bowman (1993) suggests that after the mid 1980s, the public administration model that applies to Virginia may be characterized, in part, as “The problems occasioned by uncertainty, complexity, and rapidity of change require devolution” (p. 159), noting three key emphasis areas—a stronger role for district-based decision making (as opposed to central decision making); a greater focus on congestion relief within, rather than between, urban areas; and greater reliance on public input.

Historically, such tradeoffs between the benefits of local autonomy and the benefits of greater efficiency achieved through some sharing of that autonomy is not new. Two examples of multi-state authorities—the Tennessee Valley Authority (TVA) and the Appalachian Regional Commission (ARC)—may be contrasted in terms of their responsiveness to local needs and their ability to implement a regional goal. The Tennessee Valley Authority (TVA) has a strong central authority providing power generation and land forestation but is less responsive to regional needs (Ross et al., 2008). The Appalachian Regional Commission (ARC) is more responsive to regional needs: it provides funding to 13 states for economic development but has less emphasis toward achieving a unified vision; a criticism of which has been that “ARC-funded highway construction ...[lacks]... a regional basis for coordinated development” (Ross et al., 2008).

### **Case Study: Changes in Decision Making that Might Affect Access Management of the Secondary System**

Future changes in decision making authority may affect the state's role in a variety of transportation-related areas, one of which is transport/land use coordination. There are several methods through which both individual counties and the Commonwealth can coordinate transportation and land use. County mechanisms to achieve such coordination include (1) the development of the county comprehensive plan, (2) the establishment of zoning ordinances, (3) the establishment of subdivision ordinances, (4) the county's response to site plan reviews, (5)

the secondary six year plan (VDOT, 2009b), and (6) policies for establishing proffers and impact fees. The state also has mechanisms to encourage transportation/land use coordination. These include (1) the CTB's limited access highway designation, (2) special tax districts created by the General Assembly, (3) VDOT's subdivision street requirements (which can encourage interparcel connections), and (4) access management regulations that control the approval of entrances to secondary roads.

### **Mechanisms Affected by One Change in Decision Making**

One potential change in decision making is that a county may elect to take over operational responsibilities for its secondary facilities under §33.1-84.1 of the *Code*. (This section is titled "Resumption of responsibility for secondary highways by counties" but also referred to as the "Devolution Statute" [VDOT LAD, 2007]).

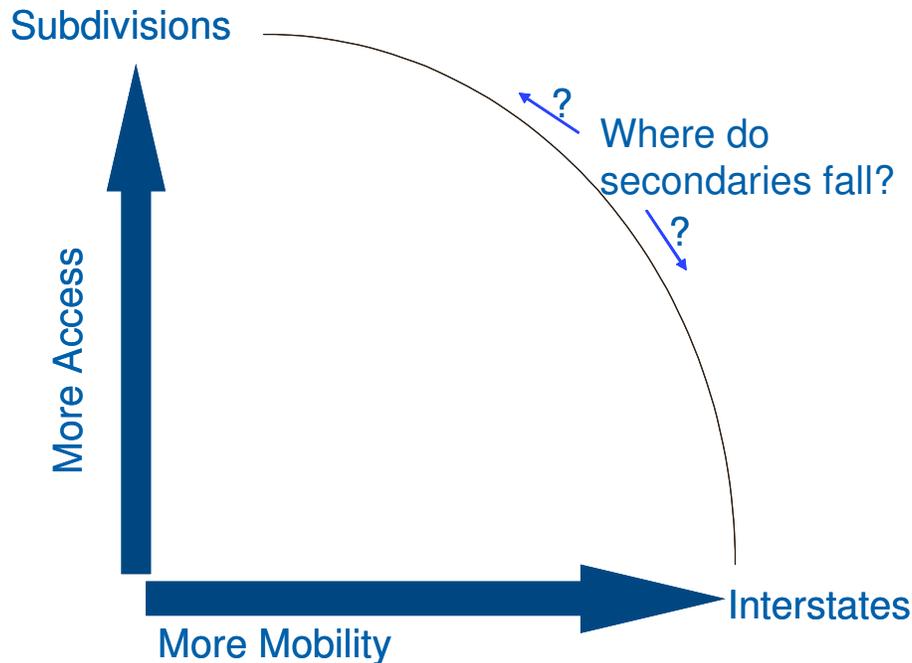
Under such a takeover, the state role in three of the above mechanisms *may* be affected substantially. First, at present, VDOT provides site plan review information, such as traffic impacts of new developments, to the county. If the county assumed operational responsibilities for its secondary system, however, then VDOT's role would be substantially curtailed with the county being fully responsible reviewing site plans (VDOT LAD, 2007a). Second, the access management regulations and standards that have been established (VDOT, 2009a) would no longer apply, rather the county would be responsible for developing and implementing its own access policies. Third, the state subdivision street acceptance requirements would not be in effect if the county, rather than the state, maintains and operates the secondary system.

To be clear, two of the mechanisms—site plan review and access management regulations—are affected only if the county choose to operate its secondary facilities. A county that chooses only to construct and/or maintain its secondary system would still be subject to the state access management regulations and standards and the chapter 527 processes. (The third mechanism—subdivision street acceptance—would be affected if the county chose the maintenance option only. Note also that the maintenance option may give the county other responsibilities that some might consider to be related to operations, such as emergency response and snow and ice control; see printed page 6 of [VDOT LAD, 2007]). Should a county elect to assume control of its facilities, then those specific responsibilities will be identified via "a negotiated devolution agreement" between VDOT and the county. Thus it is possible that specific mechanisms will vary on a case by case basis; however, the three cited here appear plausible.

### **Potential Threat: Degraded Access Management on Secondary Facilities**

The concept of access management is not new; in fact, Figure 2 is adapted based on design guidance from the American Association of State Highway and Transportation Officials (AASHTO) (1973) over three decades ago. Figure 2 suggests two types of facilities where access management decisions may be contentious. One situation where there is not agreement as to whether the facility should accommodate primarily mobility (e.g., as is the case with

freeways) or access (as is the case with local streets); that is, the placement of the facility on the curve shown in Figure 2 is not clear. (While most secondary roads are local facilities, about a quarter of secondary centerline miles are functionally classified as collector facilities and slightly more than 2% are arterial facilities [Grimes and Howe, 2009]). A second controversial situation may arise when individual developers may incur greater costs—in the form of time, land, or construction expenses—to gain access to the roadway network through sharing entrances or using interparcel connections. Because of such controversy, access management may be a productive endeavor to study in a devolved environment.



**Figure 2. Role of Secondary Facilities for Access Management**

Considering how the changes in decision making—notably, the takeover of secondary road operations by a county—might affect access management on secondary facilities, two questions arise:

- Is there a state role in such access management? One plausible argument is that VDOT’s interest in access management would stop, since counties are responsible for funding road improvements. Under such reasoning, if a secondary road widening becomes necessary because of the county’s failure to manage access, it is the county that bears the cost of this widening rather than the state.
- If the above answer is affirmative, then to what extent might individual localities continue to encourage access management? In that instance, if the state were interested in access management, then the state would have to rely on localities to implement access management on certain secondary roads where, in the future, these roads revert to full county control.

*Impact on Mechanism 1: the Access Management Regulations*

To determine whether counties might be likely to encourage access management on their own initiative, one approach is to examine the county comprehensive plan. Certainly such an approach has limitations. The comprehensive plan is advisory and is implemented through mechanisms noted previously, such as zoning ordinances and subdivision ordinances which the county may use to encourage principles such as connectivity, adequate spacing between roadway entrances, and sharing of access. It is also conceivable that a lack of access management on a given facility may reflect local and state disagreement about a particular roadway's function rather than a lack of belief in access management. Finally, comprehensive plans are periodically updated; thus another detailed review may change the findings from those presented here. To the extent that these three limitations are not fatal flaws for this case study, the language of the comprehensive plan provides a sketch-level indicator of the county's interest in access management.

A previous study (Grimes, 2006) had in fact reviewed 59 Virginia county comprehensive plans and found that about 35 of these plans support access management in some way, such as encouraging interparcel connectivity, discouraging strip development, suggesting corridor studies, or identifying specific access management techniques such as shared access, use of medians, or establishment of spacing standards. Some plans, however, proposed development that might adversely affect good access management, such as the addition of interchanges that might not meet AASHTO standards or commercial development near intersections and interchanges (Grimes, 2006).

This case study suggests two observations regarding devolution's impact on the transportation system. First, the precise impact is quite difficult to forecast: since the passage of the devolution statute (§33.1-84.1 of the *Code*) in 2001, no counties have elected to take over operations of their secondary facilities. If counties did take over operations of the secondary systems, then any information about the extent to which the county would be likely to support access management is at this time based on a review of only about two-thirds of the Commonwealth's comprehensive plans, some of which may be in the process of being updated. The second observation is that, to the extent that these plans indicate the county's support of access management, about one-third do not indicate strong encouragement of access management considerations in the planning process. Given that Figure 2 suggests some access management decisions can be difficult to implement, the observation that about a third of county plans were not found to take support access management suggests a *potential* risk of performance degradation on some secondary roads. To be clear, this case study does not guarantee such degradation would, in fact, occur: it merely raises the possibility.

### *Impact on Mechanism 3: the Subdivision Street Acceptance Requirements*

Return now to the third mechanism for transportation/land use coordination: subdivision street acceptance requirements. Although access management refers to how access points are managed along an arterial highway, a variety of actions may be taken off this arterial that support access management. One of these actions is to provide a supporting network of streets that can remove local traffic from the arterial system, and a mechanism available to the Commonwealth to implement these actions is the requirements for accepting subdivision streets into the

statewide network. The *Code of Virginia* (§ 33.1-70.3) states that “requirements to ensure the connectivity of road and pedestrian networks with the existing and future transportation network” shall be included within VDOT’s regulations for accepting subdivision streets into its secondary system. These regulations (VDOT, 2009c) incorporate the type of area where the subdivision is located (e.g., greater connectivity is required in more urban areas), the extent to which the streets are aligned in a grid pattern as opposed to a dendritic pattern (e.g., generally a higher ratio of intersections to street segments is desired), pedestrian considerations, and connectivity between properties (e.g., a series of highly interconnected streets within a subdivision that do not provide access to any other properties except via a single connection to an arterial highway are not likely to meet the requirements). Clearly a county whose facilities are not part of the statewide network is not subject to these regulations. (However, as noted in the next research steps section of this paper, this does not prevent counties from encouraging connectivity to the same degree, or a higher degree, than VDOT.)

The contribution of subdivision streets should not be understated: Gifford and Abdulkadirov (2007) estimate that between 2001 and 2005, subdivision streets accounted for more than half of the new lane miles constructed in Virginia for that period, excluding cities plus Arlington and Henrico counties.

### **Potential Solutions to Encourage Better Access Management on Secondary Facilities**

As a way to mitigate the risks of devolution, Giuliano (2007) offers the history of California’s public-private 20 mile Alameda Corridor rail line which successfully brought eight cities, three railroad companies, two ports, and two regional agencies into sufficient agreement to construct the \$2.4 billion project. The existence of fragmented power threatened to prevent construction because each entity wielded the ability to stop the project: for example, a city could have refused to allow construction without compensation for adverse impacts (e.g., higher rail volumes and construction noise) or the railroad companies could have refused to sell rights of way necessary for construction. However, the project was ultimately built, with the authority providing mitigation funds to the cities in return for their expedited permits for construction. Giuliano (2007) argues that to achieve this large scale project within a devolved environment and without increasing costs substantially, several conditions were essential, four of which are:

1. Experienced personnel who had the technical and organizational skills necessary to move this complex project forward.
2. An authority (which represented the major players, such as the two ports and the largest cities) with sufficient funding and political power to “buy out” the smaller cities that could otherwise have hindered the project.
3. Clear incentives and disincentives for cooperation, such as the threat of economic harm for the region if the project failed and mitigation funds for the cities. Incentives accrue to multiple parties such as the cities (which benefit from the reduced delays and emissions due to elimination of at-grade rail crossings [Judge, 2002] and the railroads (which benefit from added rail capacity [Alameda Corridor Transportation Authority, 2009]).

4. An understanding of the project’s regional benefits and an ability to communicate this importance to all stakeholders.

It may be possible for Virginia to apply some, but not necessarily all, lessons from Giuliano (2007) to the threat of degraded access management on the secondary system. The first challenge is to identify those facilities where secondary road access management is critical to the statewide network as opposed to providing mostly local benefits; the functional classification of the facility may help make such a determination. The second challenge is to identify conditions that mirror the four shown above but which are applicable to Virginia. Table 2 identifies potential ways to provide incentives to localities for cooperation, such as making cooperation a requirement for grant funding. Not all of the methods in Table 2 are implementable in today’s environment: for example, it is not possible at present to use a funding formula allocation that incorporates the degree of access management on the secondary system as a factor. However, some of the methods in Table 2 are feasible, such as the incorporation of standards into negotiated agreements between VDOT and localities.

**Table 2. Possible Ways to Encourage Localities to Support Access Management on the Secondary System**

<b>Condition Cited by Giuliano (2007)</b>	<b>State Mechanism to Create the Condition</b>
1. Experienced personnel	Ensure VDOT district staff can assist localities, if so requested by localities, with (1) identifying ways to implement access management techniques through the land development process and (2) estimating and reducing the costs of this implementation.
2a. Authority (with sufficient funding)	Ability to provide grants to locale to perform detailed corridor studies that identify ways to implement access management on secondary facilities through the land development process.
2b. Authority (with sufficient power)	Incorporate into the devolution agreement operational procedures that keep certain facilities at an agreed-upon standard. For example, access standards for facilities of type x must meet those followed by VDOT for that type of facility.
3. Incentives for cooperation	Funding formula allocation that includes, as a factor, degree of access management practiced by locale on the secondary system
4. Importance of the project’s regional benefits	Ability to identify a limited number of secondary facilities where access management is critical because the facility offers statewide or regional, rather than local only, benefits

The four conditions shown in Table 2 may be applied to other potential impacts of devolution. For example, consider heavy truck connectivity: if localities operate their own secondary roads (counties) or their urban system (cities), then these localities may develop their own permitting processes for overweight trucks, meaning such vehicles must obtain permits from each locale through which they travel (Ken Jennings, personal communication, September 11, 2009). Certainly, it is possible that, in the future, obtaining permits from multiple jurisdictions will not be problematic for heavy trucks; for example, overweight trucks must already obtain permits from individual cities if those vehicles will use the urban system. However, it is possible that jurisdictions might adopt different standards such that obtaining permits from multiple jurisdictions, possibly leading to inconsistent truck routes between counties (JLARC, 1992) or increased administrative costs substantially for businesses. Under this second scenario, the four conditions from Table 2 might be adopted as follows:

1. Ensure the state has sufficiently experienced personnel who can assist localities, if such assistance is desired by localities, with aligning the costs of the permit and the damage to the facility.
2. Maintain an office at the state level that is able to administer technical and financial assistance to localities as part of item (1) above.
3. Provide grants or other financial assistance to certain localities to enable them to adopt consistent standards for accommodating overweight trucks.
4. Coordinate efforts between state staff, localities, and local/state chambers of commerce to ensure that the economic impacts of maintaining a freight network on certain critical facilities is understood.

### **POTENTIAL FUTURE RESEARCH STEPS**

The benefits and disadvantages of making decisions at various levels of government may be better understood through a comprehensive research study. Such a full research study might consider the following topics.

- *Types of decisions.* The case study presented in this paper focused on just one aspect of decision making—access management. However, additional case studies besides those of access management may be undertaken where the impact of a change in decision making authority may be assessed. These other potential areas include, but are not limited to, safety (e.g., having facilities designed to a comparable standard may improve driver expectations), the use of heavy vehicle routes, land use and transportation coordination, maintenance practices, emergency response, signing or other mechanisms for providing traveler information, the use of alternative funding structures (e.g., state, regional, and local transportation authorities), and the provision of alternative modes of travel.
- *Performance of the transportation system.* Consider one dimension of transportation performance which is safety. A study might determine whether crash reductions are (a) associated with centralized entities such as Virginia where county roads are maintained by the state rather than the localities; (b) decentralized entities where localities rather than the state maintain such county roads; or (c) not attributable to either (a) or (b) because of too many other factors.
- *The extent to which various agencies exercise the authority available to them.* For example, one could assess the extent to which the state and localities have historically encouraged connectivity of subdivision streets. (As an illustration, whereas the 2009 state subdivision street standards clearly encourage connectivity, a lesser emphasis is noted in the 1996 state standards [VDOT, 1996]). Such a study might also assess the flexibility offered by these various agencies. For example, the present the subdivision

street acceptance requirements offer flexibility by area type (compact, suburban, and rural) and allow the division administrator to manage appeals (VDOT, 2009).

- *Details of how decisions are made.* Several of the examples of decision making cited herein are based on a limited number of sources, and additional details may provide a better understanding of the impacts of some of these decisions.

## CONCLUSIONS

1. *It is plausible but not certain that in the future Virginia will see more tiered planning (e.g., planning conducted at multiple administrative levels of government) than is the case at present.* This expectation arises because of two opposing forces. One force is greater devolution of some responsibilities from the state level to the local level (e.g. some aspects of project delivery and potentially management of some secondary systems). Yet conversely, there may be growth in multi-state coalitions, as exemplified by the recent I-95 and I-81 initiatives and possibly, in the longer term, some use of the megaregions concept noted in the literature (Amekudzi et al., 2007, Ross et al., 2008).
2. *It is plausible but not certain that some funding decisions will increasingly be made by non-state actors.* This paper identified three such actors who may have increased decision making power relative to the present case: (1) localities (who, through the use of various revenue generating mechanisms [e.g., property taxes, bonds, and proffers within the land development process] may construct additional transportation infrastructure), (2) MPOs (who may have increased funding authority in some situations such as the Metropolitan Mobility and Access Program in the proposed federal surface transportation program authorization), and (3) multi-state coalitions or other to-be-created planning entities. A contributing factor to the increased influence of non-state actors is the importance of non-state sources of revenue.
3. *If transportation decision-making is increasingly dispersed among multiple entities as per conclusion 2, then the literature (Giuliano, 2007) suggests it may be challenging to implement projects that either (1) offer network benefits but not a local benefit or (2) do not mitigate all adverse impacts for all entities.* State-level steps that may address these challenges include (1) providing financial incentives for cooperation (e.g., providing grant funds contingent upon achieving some measure of performance such as congestion reduction, travel time, persons served or emissions reduced); (2) ensuring staff understand the technical details required to move such projects forward and are able to communicate such projects' importance to other stakeholders; and (3) identifying which "parts" of the transportation system have statewide as opposed to local only benefits such that coordination efforts, such as negotiated agreements with localities, can be concentrated on those particular components of the system. These components may refer to (1) physical facilities such as certain links in the primary state system of roads or (2) operational processes such as the mechanism through which truck routes are identified.

4. *It appears devolution of authority is likely to continue.* This paper does not prove or disprove but merely acknowledges a rationale that some literature offers for devolution: that decentralized project delivery is more efficient to the extent that (1) a more local entity has lower administrative costs or (2) can integrate project delivery with planning or operating responsibilities. Such reasoning is given in cases where localities or regions are delivering projects that otherwise might be performed by the state; these cases include Hampton (Virginia), Suffolk (Virginia), Las Vegas (Nevada), and the Twin Cities (Minnesota) (Whitley, 2006; Bacon, 2006; Hoeft, 2007; Kozlak, 2007).

## REFERENCES

- Alameda Corridor Transportation Authority. Alameda Corridor Fact Sheet. Carson, California, 2009. [http://www.acta.org/projects/projects\\_completed\\_alameda\\_factsheet.asp](http://www.acta.org/projects/projects_completed_alameda_factsheet.asp). Accessed October 30, 2009.
- Albright, W.A., Doran, S., Campbell, C., Qualls, J., And Weems, K. *Kingsport Metropolitan Area 2030 Transportation Plan*, Kingsport Metropolitan Planning Organization, Kingsport, Tennessee, 2008. <http://mpo.kingsporttn.gov/long-range-plan>. Accessed October 22, 2009.
- Alonso-Biarge, J.M., and Ortiz, A. *Decentralization of Road Network Management: Lessons from Bolivia and Some Iber-American Countries*. The World Bank, Washington, DC, 2000.  
[http://irispublic.worldbank.org/85257559006C22E9/DOC\\_VIEWER?ReadForm&I4\\_KEY=0CAEAB9ED9D6672385256D8A004CDDD9F1F3411D4CF5870D85256F8E00579905&I4\\_DOCID=B8D6385A66D67ACE85256FEC001845A5&](http://irispublic.worldbank.org/85257559006C22E9/DOC_VIEWER?ReadForm&I4_KEY=0CAEAB9ED9D6672385256D8A004CDDD9F1F3411D4CF5870D85256F8E00579905&I4_DOCID=B8D6385A66D67ACE85256FEC001845A5&). (Note: this link will present three files in the upper left of the screen; the reader may then choose either the second or third file. It does not appear possible to provide a URL that avoids this middle step.) Accessed September 28, 2009.
- Amekudzi, A.A., Thomas-Mobley, L., and Ross, C. Transportation Planning and Infrastructure Delivery in Major Cities and Megacities. In *Transportation Research Record: Journal of the Transportation Research Board*, No. 1997. Transportation Research Board of the National Academies, Washington, DC, 2007, pp. 17-23.
- American Association of State Highway and Transportation Officials. *Policy on Design of Urban Highways and Arterial Streets*. Washington, DC, 1973.
- Bacon, J.A. The Devolution Solution. *Bacon's Rebellion*, October 23, 2006.  
<http://www.baconsrebellion.com/Issues06/10-23/Bacon.php>. Accessed September 3, 2009.
- Bacque, P. VDOT makes 'drastic' cuts in budget. *Richmond Times Dispatch*, June 19, 2009.  
[http://www2.timesdispatch.com/rtd/business/transportation/article/VDOT19\\_20090618-223004/274749/](http://www2.timesdispatch.com/rtd/business/transportation/article/VDOT19_20090618-223004/274749/). Accessed September 25, 2009.

- Bonneson, J., Sunkari, S., and Pratt, M. *Traffic Signal Operations Handbook*, Texas Transportation Institute, College Station, 2009. <http://tti.tamu.edu/documents/0-5629-P1.pdf>. Accessed October 21, 2009.
- Bristol Metropolitan Planning Organization. *Prospectus: Bristol Urban Area Metropolitan Planning Organization*. Bristol, Tennessee, undated[a]. [http://www.egovlink.com/public\\_documents300/bristol/published\\_documents/Community%20Development/Transportation/Bristol%20MPO%20Prospectus.pdf](http://www.egovlink.com/public_documents300/bristol/published_documents/Community%20Development/Transportation/Bristol%20MPO%20Prospectus.pdf). Accessed October 22, 2009.
- Bristol Metropolitan Planning Organization. *Fiscal Year 2008 – 2011 Transportation Improvement Program*, Bristol, Tennessee, undated[b]. [http://www.egovlink.com/public\\_documents300/bristol/published\\_documents/Community%20Development/Transportation/2008-2011%20Transportation%20Improvement%20Program.pdf](http://www.egovlink.com/public_documents300/bristol/published_documents/Community%20Development/Transportation/2008-2011%20Transportation%20Improvement%20Program.pdf). Accessed October 22, 2009.
- Code of Virginia*. § 33.1-84.1. Richmond. <http://leg1.state.va.us/cgi-bin/legp504.exe?000+cod+33.1-84.1>. Accessed August 18, 2009.
- Corridors of the Future Development Agreement Between the United States Department of Transportation and the Florida Department of Transportation, the Georgia Department of Transportation, the South Carolina Department of Transportation, the North Carolina Department of Transportation, the Virginia Department of Transportation for the Interstate 95 Corridor of the Future. 2009. <http://www.virginiadot.org/news/resources/Statewide/95DevelopmentAgreement.pdf>. Accessed August 21, 2009.
- Federal Highway Administration. *Corridors of the Future*. Washington, DC, 2009. <http://www.corridors.dot.gov/>. Accessed August 21, 2009.
- Fischer, J.W., Kirk, R.S., Mallett, W.J., Peterman, D.R., Frittelli, J., Luther, L., and McCarthy, J.E. *Surface Transportation Reauthorization Legislation in the 111th Congress: Summary of Selected Major Provisions*. Congressional Research Service, Washington, DC, 2009. <http://www.itsa.org/itsa/files/pdf/ReauthMajorProvisions.pdf>. Accessed September 29, 2009.
- Forrest, P. *Report for Counties Assuming Responsibility for their Secondary Construction Program: House Document 80*, Commonwealth of Virginia, Richmond, 2005. [http://leg2.state.va.us/dls/h&sdocs.nsf/fc86c2b17a1cf388852570f9006f1299/fecc6a44cd19600f85256fd4004ef8b1/\\$FILE/HD80.pdf](http://leg2.state.va.us/dls/h&sdocs.nsf/fc86c2b17a1cf388852570f9006f1299/fecc6a44cd19600f85256fd4004ef8b1/$FILE/HD80.pdf). Accessed October 28, 2009.
- Gifford, J. and Abdukadirov, S. *Private Sector Investment in Roads and Streets as a Byproduct of The Development Process in the U.S.: The Virginia Experience*, Transportation Research Board Annual Meeting, Washington, D.C., 2007.

- Giuliano, G. The Changing Landscape of Transportation Decision Making. In *Transportation Research Record: Journal of the Transportation Research Board*, No. 2036. Transportation Research Board of the National Academies, Washington, DC, 2007, pp. 5-12.
- Grimes, M.C. *An Evaluation of County Comprehensive Plans in Virginia*. VTRC 07-R6. Virginia Transportation Research Council, Charlottesville, 2006. [http://www.viriniadot.org/vtrc/main/online\\_reports/pdf/07-r6.pdf](http://www.viriniadot.org/vtrc/main/online_reports/pdf/07-r6.pdf). Accessed August 24, 2009.
- Grimes, M.C. and Howe, R.W. *House Document No. 11: A Plan for Reassigning Roads to Virginia's Administrative Classification System Using the Federal Functional Classification System: A Response to Chapter 896 of the Acts of Assembly of 2007*, Richmond, 2009. [http://leg2.state.va.us/dls/h&sdocs.nsf/fc86c2b17a1cf388852570f9006f1299/69fad22386f32d0852572b900687105/\\$FILE/HD11.pdf](http://leg2.state.va.us/dls/h&sdocs.nsf/fc86c2b17a1cf388852570f9006f1299/69fad22386f32d0852572b900687105/$FILE/HD11.pdf). Accessed October 27, 2009.
- Hazard, J.L. *Managing National Transportation Policy*. The Eno Foundation for Transportation, Inc., Westport, CT, 1988.
- Herd, M., Chandler, M., Harrington, T., Jacocks, B., and Eldon James & Associates, Inc (original authors) and Eldon James & Associates, Inc. (updated this edition). *Managing Growth and Development in Virginia: A Review of the Tools Available to Localities 2008 – Edition*, Virginia Chapter of the American Planning Association, Richmond, 2008. <http://apavirginia.org/documents/pdf/APA%20Virginia%20Growth%20Tools%202008.pdf>. Accessed October 22, 2009.
- Hoelt, B.H. MPOs As Operating Agencies: The Southern Nevada Experience. In *The Metropolitan Planning Organization, Present and Future*. Conference Proceedings 39. Transportation Research Board of the National Academies, Washington, DC, 2007, pp. 45-46.
- Joint Legislative Audit and Review Commission. *State/Local Relations and Service Responsibilities: A Framework for Change, Senate Document No. 37*, Richmond, 1992. See pp. 75, 79-80.
- Judge, T. Alameda Corridor Shows how its Done, Railway Track and Structures, Volume 98, No. 11, Simmons-Boardman Publishing Corporation, New York, New York, 2002 (abstract only).
- Kozlak, M.C. The Future of MPOs: MPOs Combined with Operations and Management—The Twin Cities Experience. In *The Metropolitan Planning Organization, Present and Future*. Conference Proceedings 39. Transportation Research Board of the National Academies, Washington, DC, 2007, pp. 44-45.

- Mason, J. Transportation Planning and Programming: Challenges and Implications. In *Key Issues in Transportation Programming*. Conference Proceedings 43. Transportation Research Board of the National Academies, Washington, DC, 2008, pp. 67-68, <http://onlinepubs.trb.org/onlinepubs/conf/CP43.pdf>. Accessed February 24, 2009.
- McKenzie, J. The State of the MPO. In *The Metropolitan Planning Organization, Present and Future*. Conference Proceedings 39. Transportation Research Board of the National Academies, Washington, DC, 2007, pp. 8-11.
- Memorandum of Understanding: I-81 Regional Commerce Corridor. <http://www.virginiadot.org/projects/resources/I-81MOUoctober08.pdf>. Accessed September 14, 2009.
- Menchik, M.D. *Devolving Selected Federal-Aid Highway Programs and Revenue Bases: A Critical Appraisal*. Report A-108. Advisory Commission on Intergovernmental Relations, Washington, DC, 1987.
- Metropolitan Council. *History of the Metropolitan Council*. St. Paul, MN, 2008. <http://www.metrocouncil.org/about/MetCouncilHistory.pdf>. Accessed September 14, 2009.
- Miller, J.S., Hoel, L.A., Dalton, T.F., and McCray, D.R. *Defining Effective Regional Planning in Virginia*, VTRC Report 07-R8, Charlottesville, 2006. [http://www.virginiadot.org/vtrc/main/online\\_reports/pdf/07-r8.pdf](http://www.virginiadot.org/vtrc/main/online_reports/pdf/07-r8.pdf). Accessed October 22, 2009.
- Moscovich, J.L. Regional Versus County Investments. In *Key Issues in Transportation Programming*. Conference Proceedings 43. Transportation Research Board of the National Academies, Washington, DC, 2008, pp. 36-37. <http://onlinepubs.trb.org/onlinepubs/conf/CP43.pdf>. Accessed February 24, 2009
- NPA Data Services, Inc. 2007 Regional Economic Projection Series: Economic, Household, & Demographic Totals, 1969-2030, State Service Virginia. CD-ROM. Alexandria, VA, 2008.
- O'Connell, L., Yusuf, J.E., Hackbart, M., Hartman, D., Wallace, C., and Kreis, D. *Today's DOT and the Quest for More Accountable Organizational Structures*, Kentucky Transportation Center, Lexington. [http://www.ktc.uky.edu/Reports/KTC\\_05\\_41\\_TA\\_18\\_04\\_1F.pdf](http://www.ktc.uky.edu/Reports/KTC_05_41_TA_18_04_1F.pdf). Accessed October 21, 2009.
- PB and ECONorthwest. *Regional HOT Lanes Network Feasibility Study: Phase 2, Task 13 – Governance Review*, Metropolitan Transportation Commission, Oakland, 2007. [http://www.mtc.ca.gov/planning/hov/Task\\_13\\_Governance.pdf](http://www.mtc.ca.gov/planning/hov/Task_13_Governance.pdf). Accessed October 22, 2009.

- Pedersen, N. and Morris, M. Working Successfully with Decision Makers, In *The Metropolitan Planning Organization, Present and Future*, Conference Proceedings 39, TRB, Washington, D.C., 2007, pp. 27-28.
- Regional Plan Association. America 2050: Northeast.  
<http://www.america2050.org/northeast.html>. Accessed August 25, 2009.
- Ross, C.L., Barringer, J., Yang, J., Woo, M., Doyle, J., West, H., Amekudzi, A., and Meyer, M. *Megaregions: Literature Review of the Implications for U.S. Infrastructure Investment and Transportation Planning*. FHWA-BAA-HEPP-02-2007 Federal Highway Administration, Washington, DC, 2008.  
<http://www.fhwa.dot.gov/Planning/megaregions.pdf>. Accessed June 5, 2009.
- Roth, D.L., and Aggarwala, R.T. Whose Railroad Is This, Anyway? Opportunities and Challenges in Regionalizing the Northeast Corridor. In *Transportation Research Record: Journal of the Transportation Research Board*, No. 1785. Transportation Research Board of the National Academies, Washington, DC, 2002, pp. 1-9.
- Rylander, C.K. Paving the Way: A Review of the Texas Department of Transportation, Austin, 2001. <http://www.cpa.state.tx.us/txdot/txdot405.html>. Accessed October 23, 2009.
- Seefeldt, K.K., Adams, S.W., Hollimon, H.O., Holland, J.T., Muehlenbeck, T.H., and West, L.B. Report of the Local Government Advisory Committee to the Commission on Transportation in the Twenty-First Century, [Richmond], 1987. Available from the VTRC library as HE 213.V8 C666 1987, p. 10.
- Shulleeta, B. Albemarle board gives Hatton Ferry a reprieve. *The Daily Progress*, July 2, 2009. [http://www2.dailyprogress.com/cdp/news/local/article/albemarle\\_board\\_gives\\_hatton\\_ferry\\_a\\_reprieve/42337/](http://www2.dailyprogress.com/cdp/news/local/article/albemarle_board_gives_hatton_ferry_a_reprieve/42337/). Accessed September 3, 2009.
- Street sense in Arlington. *The Washington Post*, August 18, 2009, p. A14.
- U.S. Department of Transportation, Maritime Administration. *Report to Congress on the Performance of Ports and the Intermodal System*. Washington, DC, 2005.  
[http://www.marad.dot.gov/documents/Rpt\\_to\\_Congress-Perf\\_Ports\\_Intermodal\\_System-June2005.pdf](http://www.marad.dot.gov/documents/Rpt_to_Congress-Perf_Ports_Intermodal_System-June2005.pdf). Accessed April 29, 2009.
- U.S. Government Accountability Office. *Homeland Security: Effective Regional Coordination Can Enhance Emergency Preparedness*. GAO-04-1009. Washington, DC, 2004.  
<http://www.gao.gov/new.items/d041009.pdf>. Accessed August 26, 2009.
- U.S. House of Representatives, Committee on Transportation and Infrastructure. *The Surface Transportation Authorization Act of 2009: A Blueprint for Investment and Reform*. Presented by J.L. Oberstar, J.L. Mica, P.A. DeFazio, and J.J. Duncan, Jr. Washington, DC, 2009a. [http://www.amp.org/assets/816\\_blueprint.pdf](http://www.amp.org/assets/816_blueprint.pdf). Accessed August 19, 2009.

- U.S. House of Representatives, Committee on Transportation and Infrastructure. The Surface Transportation Authorization Act of 2009 [Proposed Reauthorization]. Washington, DC, 2009b. [http://www.ampo.org/assets/818\\_surfacetransportationact20.pdf](http://www.ampo.org/assets/818_surfacetransportationact20.pdf). Accessed August 19, 2009.
- Vander Lugt, R.D., and Virkar, S. *Coordination of Transportation Planning and Land Use Controls: A Challenge for Virginia in the 21st Century*. VTRC 91-R10. Virginia Transportation Research Council, Charlottesville, 1991. [http://www.virginiadot.org/vtrc/main/online\\_reports/pdf/91-r10.pdf](http://www.virginiadot.org/vtrc/main/online_reports/pdf/91-r10.pdf). Accessed September 29, 2009.
- Virginia Association of Counties. Is 95 the Perfect Number?, in *County Connections*, March 1, 2009, pp. 5-9. <http://www.vaco.org/CountyConnectionsFiles/2009CountyConnections/connections30109.pdf>. Accessed October 28, 2009.
- Virginia.gov. Secondary Street Acceptance Requirements, Richmond, 2009, <http://www.virginiadot.org/projects/ssar/>. Accessed October 29, 2009.
- Virginia Department of Transportation. *Subdivision Street Requirements*, Richmond, 1996.
- Virginia Department of Transportation. Presentation titled “The Virginia Department of Transportation Infrastructure Assets”, Auditor of Public Accounts, Richmond, 2000. [http://www.apa.state.va.us/data/download/gasb34/001108\\_vdot\\_presentation.ppt](http://www.apa.state.va.us/data/download/gasb34/001108_vdot_presentation.ppt). Accessed October 28, 2009.
- Virginia Department of Transportation. Access Management Regulations and Standards. Richmond, 2009a. <http://www.virginiadot.org/projects/accessmgt/default.asp>. Accessed September 29, 2009.
- Virginia Department of Transportation. Media FAQ. Richmond, 2009b. [http://www.virginiadot.org/newsroom/media\\_faq.asp](http://www.virginiadot.org/newsroom/media_faq.asp). Accessed October 27, 2009.
- Virginia Department of Transportation. *Secondary Street Acceptance Requirements VDOT Internal Training*, Richmond, 2009c. [http://www.virginiadot.org/projects/resources/SSAR/070609\\_June\\_Training\\_June\\_10.pdf](http://www.virginiadot.org/projects/resources/SSAR/070609_June_Training_June_10.pdf). Accessed October 29, 2009.
- Virginia Department of Transportation, Local Assistance Division. *Guide to County Assumption Of Secondary Roads (Devolution Guidebook)*. Richmond, 2007. <http://www.virginiadot.org/business/resources/SecRoadsFinalDevolutionGuide3-30-07.pdf>. Accessed August 18, 2009.
- Virginia Department of Transportation, Local Assistance Division. *Locally Administered Projects (LAP) Manual, Part 1: Program Development, Chapter 8: Project Initiation and Authorization*. Richmond, 2009a.

- [http://www.virginiadot.org/business/resources/local\\_assistance/LAD\\_LAP\\_manual\\_final/CH8\\_Project\\_Initiation\\_and\\_Authorization.pdf](http://www.virginiadot.org/business/resources/local_assistance/LAD_LAP_manual_final/CH8_Project_Initiation_and_Authorization.pdf). Accessed September 25, 2009.
- Virginia Department of Transportation, Local Assistance Division. Urban Construction Initiative (First Cities). Richmond, 2009b. <http://www.virginiadot.org/business/local-assistance-firstCities.asp>. Accessed August 19, 2009.
- Virginia Railway Express. About VRE, Alexandria, 2009. <http://www.vre.org/about/company/nvtc-prtc.html>. Accessed October 22, 2009.
- Virginia Railway Express. *Virginia Railway Express Comprehensive Annual Financial Report*, Alexandria, 2008. [http://www.vre.org/about/Financial\\_statements/VRE\\_FY2008\\_Financial\\_Stm\\_2008.pdf](http://www.vre.org/about/Financial_statements/VRE_FY2008_Financial_Stm_2008.pdf). Accessed October 22, 2009.
- Weiner, E. *Urban Transportation Planning in the United States: An Historical Overview*, Fifth Edition, FHWA, Washington, DC, 1997.
- Whitley, F. Virginia's First Cities Initiative: Allowing Cities to Manage Their Own State Urban Road Construction Programs. *APWA Reporter*, Vol. 73, No. 6, 2006, pp. 26-27. <http://www.virginiadot.org/business/resources/ladFirstCitiesInitiative.pdf>. Accessed August 25, 2009.
- Yusuf, J.E.W., O'Connell L., Hackbart M., and Wallace, C. An Empirical Examination of the Statutory Characteristics and Effects of Highway and Transportation Commissions on DOT Capital Management Capacity, *Public Works Management & Policy*, Sage Publications, Vol., 12, No. 3, pp. 533-543, January 2008. <http://pwm.sagepub.com/cgi/reprint/12/3/533.pdf>. Accessed October 27, 2009.