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## Can highway investment policies influence regional growth?

John S. Miller<sup>a,\*</sup>, Lester A. Hoel<sup>b</sup>, David B. Ellington<sup>c</sup><sup>a</sup> Virginia Transportation Research Council, 530 Edgemont Road, Charlottesville, VA 22903, United States<sup>b</sup> Center for Transportation Studies, University of Virginia, United States<sup>c</sup> E.I.T. Kimley-Horn and Associates, Inc., United States

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## ABSTRACT

If a highway investment policy instrument is to alter growth in the manner desired, two criteria must be satisfied: (1) the policy instrument must be implemented, and (2) the implementation must achieve the desired policy goal. A look at three decades of highway policy goals (slowing net population growth, reducing arterial congestion, and fostering city-specific population increases) and policy instruments (zoning and sewer restrictions, gridded networks, and highway facility construction or non-construction) provided insights regarding the extent to which Virginia's growth-oriented highway investment decisions satisfied these two criteria.

Crucial to the first criterion is that a policy instrument will not be implemented if it lacks a supporting mechanism. For example, the policy instrument of gridded networks in this study lacked any ordinance, financial incentive, or training to facilitate its implementation. Crucial to the second criterion is that highway investments are not effective for achieving a growth-related policy goal. Development will continue in a region despite efforts to slow it by deleting new roads from master plans or will occur elsewhere despite efforts to target it in a specific area.

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## 1. Introduction

For a highway investment policy instrument to achieve an intended growth-related policy goal, two criteria must be met: (1) the policy instrument must be implemented, and (2) the policy instrument must influence growth in the manner intended. For the purposes of this study, a *policy instrument* is an action proposed by stakeholders—planners, elected officials, and advocacy groups—to achieve a specific *policy goal*. Growth-related *policy goals* include a change in residential or commercial activity or related concerns such as emissions or congestion reduction. *Implementation* of a particular policy instrument may require enacting particular laws, creating coalitions, training staff, or using other resources.

When developing long-range plans that contain policy instruments designed to influence growth, stakeholders should first consider how these two criteria will be satisfied. For example, if a new highway is intended to stimulate commercial growth in a rural, economically depressed area, stakeholders must first assess the likelihood that the road will be constructed. Then, stakeholders must assess the likelihood that the new road will increase commercial development as intended. Both assessments will be completed many years before it is known if the policy instrument was implemented or if its implementation achieved the desired goal. Accordingly, guidance is needed that can help planners to predict whether a proposed policy instrument is likely to satisfy these two criteria.

This paper examines the extent to which the two criteria have been satisfied in Virginia by examining the decision process used in Virginia localities over three decades. Three case studies were used to achieve this end. The Virginia

\* Corresponding author: Tel.: +1 434 293 1999; fax: +1 434 2931990.  
 E-mail address: [john.miller@vdot.virginia.gov](mailto:john.miller@vdot.virginia.gov) (J.S. Miller).

experience should provide important guidance to other localities that may wish to use highway investment policy to influence growth.

## 2. A review of the literature

Although the literature concerning the use of transportation investment policy as a means to influence regional growth is extensive, most studies in the literature address only one or the other of the two criteria of interest in this paper.

### 2.1. Criterion 1: will the policy instrument be implemented?

Several studies show that policy instruments that rely on top-down regional planning are less likely to be implemented than those that do not require top-down planning [16,40,63]; a review of the studies of Downs [16] and Talvitie [63] suggested that the probability of a policy instrument being implemented is increased if it can be subdivided into intermediate steps that do not require a strong central authority.

Further, implementation requires the mitigation of any adverse impacts of the policy instrument [1]. Such resolution may be achieved through compensating adversely affected parties, such as taxi drivers who are given rebates because of congestion pricing [18] or developers who are given subsidies and tax incentives to help limit urban area expansion [4]. This resolution may also come about through persuasion, such as the development of constituency groups to champion changes in policy [40], responses to technical questions when they are likely to influence public opinion [73], an effective explanation of the policy's benefits [34], marketing efforts [35], and education and training efforts [39].

The literature is not in agreement as to how implementation is best achieved. Porter noted that the reliance on voluntary tactics results in inconsistent impacts on land use [52], implying that regions need to develop ways to implement regulatory techniques. Talvitie noted that incremental choices are part of the planning process but expressly warned against using a "linear, goal-directed approach," suggesting that planners instead focus on better understanding the reasons various stakeholders might resist a particular policy [63]. Although there may be a finite number of policy instruments that can be put into practice, the "number of management strategies may be limitless" [4].

### 2.2. Criterion 2: will the implemented policy instrument achieve the desired outcome?

Some literature suggests that highway investment policy instruments strongly influence land development [66], but the degree of influence is not fully known [23]. Transportation investments that influence individuals' location decisions include freeways and interchanges [12], corridor improvements [11], public transportation improvements [68], and transportation pricing [2]. The two-way interaction between these infrastructure investments and land use patterns has been noted [5,42,51],

especially in the situation when location decisions made in response to changes in travel speed yielded constant commute times [37]. Transport investments may also influence home prices [6] and may generate or redistribute economic growth [75,76].

Other literature suggests that transportation investments have a minor influence on land development because urban regions already have a high degree of accessibility even without additional transportation improvements [3,5,40,74]. Further, land development is influenced by many factors [15,47] such as changes to the work force as baby boomers age; an increase in the number of households with multiple workers [49]; and the availability of developable land and developer incentives, such as reduced property taxes as an incentive to use infill areas [38].

It has been reported that a "paucity of data" [47, p. 103] hinders an accurate assessment of the impact of growth management on urban area size. A contributing factor is the long period of time required to assess transportation and land use interactions [22,52]. In addition, transportation investments may be a derived demand responding to growth already in place [29]. Further factors include prediction errors associated with urban travel demand models [54] and difficulties determining what variable should be measured at the outset of an experiment [41]. All these factors may explain why the land development impacts of federally funded highway improvements are not routinely assessed [26].

### 2.3. Questions the literature does not answer

Surprisingly, as noted earlier, the literature does not fully address the extent to which highway investment decisions can be articulated as a set of discrete policy goals and instruments. The true relationship between the underlying goal and the supporting policy instruments becomes at best tenuous when three questions are raised:

1. Based on historical evidence, what was the policy goal of decision makers?
2. Was the policy goal the reason for the implementation of various policy instruments or were those instruments implemented for other reasons?
3. Can a determination of a successful policy outcome be made from a decision maker's point of view?

Resolution of these questions is a necessary step toward satisfying the two policy criteria posed in this paper.

## 3. A case study methodology to answer these questions

An open-ended survey of Virginia planning professionals suggested eight situations where policy goals and corresponding instruments were of interest to planners [17]. Further study showed that supporting data were available for three policy goals, each having one or more

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