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Promotion of active transportation among state departments of transportation in the U.S

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ABSTRACT

Objectives: This research aimed to assess the level of support for active transportation among state departments of transportation (DOTs) in the U.S.*Methods:* We conducted an inventory plans adopted by 51 state DOTs and a survey of state DOT pedestrian and bicycle coordinators in the U.S. in 2010 (n=39, 72% response rate).*Results:* Overall, the plans were not very encouraging of planning and design elements that would encourage walking and bicycling. Only two items (Establish pedestrian and bicycle facilities requirements and standards and Safer intersections for pedestrians and bicyclists) were encouraged or required by at least half of the states. States were more supportive of including bicycle and pedestrian facilities (e.g. trails, sidewalks, and bike lanes) and less supportive of policies related to land use and urban design and reallocating road space (e.g. road diets or narrower streets). The overall levels of support were positively correlated to levels of urbanization. According to the state coordinators, support for bicycle and pedestrian projects and policies increased over time, but support is stronger among top management than highway engineering staff. Funding was identified as the major implementation barrier, particularly in more rural states.*Conclusions:* Change within state DOTs to incorporate bicycle and pedestrian modes is a slow process, influenced by both management and engineering staff. Education at several levels and through different mechanisms could play an important role in changing DOT culture, though funding for projects is also a major barrier. Effective advocacy groups may also play a positive role.

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1. Introduction

In the U.S., state departments of transportation (DOTs) play a key role in planning, designing, and building transportation infrastructure, as well as setting broad policy. DOTs historically have focused on highways, but their scope has been expanding. The Intermodal Surface Transportation Efficiency Act (ISTEA), passed by the U.S. Congress in 1991, required states to include bicycling and walking in their transportation plans, opened up several new funding sources for bicycle and pedestrian facilities, and required each state DOT to have a bicycle and pedestrian coordinator (Pucher et al., 1999). Since ISTEA, federal spending on bicycle and pedestrian projects increased dramatically, from about \$38 million in 1992 to over

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\$450 million in 2002 (Cradock et al., 2008). A survey of state DOTs in early 1992 found that few states had statewide bicycle plans (Ferguson and Montgomery, 1993). A 1995 review of state and regional transportation plans concluded that the plans met the new ISTEA requirements to “consider” walking and bicycling, but most did not propose specific actions (Moe et al., 1997).

The role that public policy and planning can play in encouraging more physically active, and therefore potentially healthier, modes of transportation has been the focus of much research over the past decade (Rodriguez et al., 2016; Sallis et al., 2009; Schilling et al., 2009). There is an increasing body of evidence linking plans and policies to health-related outcomes. Research has linked zoning policies to levels of physical activity (Leider et al., 2016) and active travel to work (Chriqui et al., 2016), urban containment policy to active commuting (Aytur et al., 2008), land use plans to walking and bicycling (Aytur et al., 2007), and state safe routes to school-related laws to active travel to school (Chriqui et al., 2012). Research specifically linking transportation or bicycle and pedestrian plans to outcome measure is limited, particularly at the state level. Research has found that state policy can be important in encouraging spending at the regional level on bicycle and pedestrian projects (Handy and McCann, 2010). Research in North Carolina suggested that local pedestrian and bicycle plans were associated with better pedestrian (but not bicycle) safety outcomes (Kerr et al., 2013).

Given the potential influence of state DOTs on local pedestrian and bicycle planning and infrastructure, it is useful to understand why states may or may not adopt more innovative policies. Early research found that factors influencing state-level policy innovation vary by policy, but can include internal determinants, regional networks, and national interactions (Berry, 1994). Internal determinants are internal to the state, such as economic, demographic, and political factors. Regional diffusion theories posit that states are more likely to adopt policies already adopted by nearby states. National interaction theories presume that policy actors interact at the national level through networks, thus exposing them to new policy ideas. Proximity was found to be a factor in the adoption of city-level pedestrian plans (Aytur et al., 2013) and local or regional complete streets policies (Moreland-Russell et al., 2013), consistent with the regional network theory. Other policy change research has identified significant changes external to the organization as a motivator for major change (Barrella et al., 2013). Research on transport agencies in Melbourne, Australia found evidence of path dependency explaining policy inertia and lack of innovation, with the dominance of roads agencies limiting the integration of public transit into the system (Low and Astle, 2009).

Research examining state DOTs has often found the agencies to be slow to change, for a range of reasons. A national review of how state DOTs change conducted soon after ISTEA noted that “there is little evidence that fundamental change has penetrated very deeply in most of these organizations,” (National Academy of Public Administration (NAPA), 1995, p. 2). Resistance to change and funding were identified as the two greatest obstacles to responding to change. Miller and Lambert (2014) concluded that popular reforms in public agency management of the 1990s had little effect on transportation agencies in part because of the long timelines required for transportation planning and project implementation. In 2001, the Transportation Research Board (TRB), under the direction of the American Association of State Highway and Transportation Officials (AASHTO), undertook a broad effort to address “managing change” in state DOTs, noting that “change management is now the major preoccupation of senior management. However, the rate of change is very uneven and not well-understood,” (Stein and Sloane, 2001, Forward). An analysis of state DOT implementation activities to address sustainability issues found that the topic was often compartmentalized, perhaps limiting the effectiveness and scope of such efforts (Barrella et al. 2013). Though not addressed in that research, pedestrian and bicycle efforts could be similarly compartmentalized within a DOT.

The role of higher levels of government in innovative transportation policy adoption is mixed. In a review of research on transportation policy transfer between cities, Marsden and Stead (2011) noted the limited evidence of coercive mechanisms as a motivator. Research on the adoption of local complete streets policies found that the presence of a state policy was not a factor (Moreland-Russell et al., 2013). On the other hand, a review of state DOT sustainability plans found that the quality of the plan was driven by a state mandate (Mansfield and Hartell, 2012). That study also found that the availability of external funding was associated with better plan quality. This is consistent with research that found that the availability of state funding was associated with the adoption of local pedestrian and bicycle plans in North Carolina (Aytur et al., 2013).

Studies of policy transfer between jurisdictions have identified a number of factors facilitating and limiting innovation related to internal operations. A review of 11 cities in North America and Northern Europe identified four barriers to learning: the organizational learning culture (e.g. lack of being open and outward looking), unsystematic searches, the quality of the evidence base, and risk aversion (Marsden et al., 2011). A lack of staff time was identified as one factor in limiting the search for new ideas. Research at the city level found the use of trusted peer networks in transferring transportation policy, particularly between cities with similar contexts (Marsden et al., 2012).

Most of the research notes the importance of different actors in the process of policy change and implementation, including elected officials, agency management and staff, outside consultants and experts, and interest groups (Marsden and Stead, 2011). Using 11 city case studies, Marsden et al. (2012) noted the importance of the preferences of practitioners involved. Research on state DOTs has noted the lasting impact of significant growth during the Interstate highway building era starting in 1956, thus shaping the personnel leading the agencies in later decades (NAPA, 1995). With respect to state DOTs, Miller and Lambert (2014) noted the need for “specialized skill sets that are not necessarily consistent with traditional highway engineering skills” (p. 314). However, interviews with state DOT management identified skilled staff as the greatest strength the agencies had to respond to change (NAPA, 1995).

Whether large shares of state DOT management and staff have the appropriate skills and knowledge regarding

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