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Climate Adaptation and Resiliency Planning: Agency Roles and Workforce Development

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Issue

Because climate change is increasing the intensity and frequency of many extreme weather events,¹ climate adaptation and resiliency planning are increasingly important tasks for transportation agencies at all levels of government. Considering the variety of events that impact the transportation system, transportation professionals must consider a host of different adaptation actions, ranging from changes in maintenance and communication procedures to changes in design and even the relocation or replacement of infrastructure.

The importance and complexity of this work is spurring a rapid expansion of new adaptation tools and numerous adaptation pilot projects. The roles for different types of agencies in implementing these measures have yet to be clearly delineated. Moreover, while workforce development in transportation is recognized as a critical issue, relatively little is currently known about the specific workforce development needs for climate adaptation.

The Climate Adaptation Planning Survey (CAPS), an online survey of planners and other professionals conducted in June 2015, assessed the adaptation planning capacity, the adequacy of technical tools, and current preparation levels of local and state agencies as well as the workforce development needs faced by transportation planning agencies as they increasingly focus their work on adaptation to climate change.

Key Research Findings

Local, regional, and state agencies all have important roles to play in adaptation planning. While state and federal governments provide approximately 70% of all surface transportation funding,² towns, municipalities, and counties own more than 75% of all road miles and nearly 50% of all bridges in the United States.³ A lack of resilience at any jurisdictional level threatens the resilience of the entire system since the transportation system must function seamlessly across jurisdictions. Moreover, many aspects of adaptation planning, such as modeling climate threats and assessing infrastructure criticality, are most efficiently and effectively conducted across jurisdictional boundaries. Therefore, adaptation and resiliency planning need to be a collaborative process across all levels of government.

There is a “preparation gap” between identified climate threats and preparation for these threats. A preparation gap is any instance when an agency is aware of its exposure to a particular climate threat but is not yet preparing for that threat. The CAPS identified that only 20% to 80% (depending on the threat) of agencies at risk from a given threat are actively preparing for that threat. Modeling confirmed that whether an agency was preparing for a threat was related to many factors including financial resources, technical tools, staffing, and agency type (state versus local).

POLICY BRIEF

Local agencies may be lagging behind their state counterparts in climate adaptation and resiliency planning. For almost all threats, the proportion of at-risk local agencies preparing for a given threat was lower than the proportion of at-risk state agencies preparing for the same threat. These differences were statistically significant for increased precipitation, landslides, and increased run-off.

Tools and resources, especially staff time, are barriers to adaptation efforts. CAPS respondents rated the sufficiency of agency resources and adequacy of technical tools on a 0 – 10 scale. Among the resource sufficiency ratings, financial resources received the lowest score (an average of 3.1) while the knowledge of staff received the highest score (an average of 5.1). Rating of the adequacy of technical tools ranged from a 4.1, for tools for identifying and executing adaptation actions, to a 6.9 for tools for inventorying and monitoring transportation assets. The likelihood that respondents were biased towards the most active agencies makes these low ratings particularly concerning.

Respondents in the study affirmed that workforce development is an important part of advancing adaptation planning. A higher level of specificity of the skills and qualifications for climate adaptation planning is needed to inform development of new training, new hires, and educational curriculum that prepares the future workforce. The survey pointed to the following four needs to address adaptation planning workforce development:

1. Provide additional funding.
2. Develop a continuum of capacity-building offerings.
3. Develop communities of practice.
4. Make use of online learning technologies.

Further Reading

This policy brief is drawn from the NCST Research Report “Climate Adaptation and Resiliency Planning: Agency Roles and Workforce Development Needs” available at <https://ncst.ucdavis.edu/project/assessing-network-critically-for-climate-adaptation-planning/>

¹ Walsh, J., D. Wuebbles, K. Hayhoe, J. Kossin, K. Kunkel, G. Stephens, P. Thorne, R. Vose, M. Wehner, J. Willis, and others. Ch. 2: Our Changing Climate. Climate Change Impacts in the United States: The Third National Climate Assessment, 2014, pp. 19–67.

² Rall, J., A. Wheet, N. J. Farber, and J. B. Reed. Transportation Governance and Finance. The National Conference of State Legislatures and the American Association of Highway and Transportation Officials, 2011.

³ FHWA. Highway Statistics 2012. Office of Highway Policy Information, 2013.

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