

INFORMED DECISIONS ON CATASTROPHE RISK

Identifying and Reducing Barriers to Infrastructure Catastrophic Risk Insurance: Transportation Infrastructure Systems

Researchers from the Wharton Risk Management and Decision Processes Center are undertaking a study funded by the Department of Homeland Security's Critical Infrastructure Resilience Institute (CIRI). The purpose of the project is to identify barriers and opportunities for improving infrastructure insurance and resilience for catastrophic events and disruptions. This issue brief summarizes the key findings and recommendations upon completion of the first two phases of the project.

The U.S. transportation network is:



Disruptions to transportation infrastructure slow community recovery after an event and can cause extensive social and economic impacts.

In some cases, substantial federal funding is issued in support of infrastructure repair and restoration, as authorized by the Stafford Disaster Relief and Emergency Assistance Act.

Restoration costs and the proportion of disaster-related costs paid by the federal government continue to rise.

This research involved a review of existing literature and technical reports, as well as interviewing some key insurers and infrastructure risk managers dealing with significant and varied transportation systems across the country.

This enabled us to gain insight into catastrophic risk management strategies and insurance programs in this marketplace and identify key needs for improving transportation infrastructure resilience, insurance products, and uptake of coverage.

Risk management tools, including insurance and mitigation measures, can reduce the impacts and/or improve the recovery time from low probability but high impact infrastructure disruptions.

The following key themes were identified:

- need for more and better data
- need for metrics to measure resilience
- need for research on emerging risks
- impact of reliance on federal funding for disaster relief
- insurance as a tool for resilience financing
- benefits of risk engineering services of insurance

Recommendations for DHS	Justification
<p>1. Continue working towards revisions of the Stafford Act</p>	<ul style="list-style-type: none"> • The insurance/reinsurance market is limited in the total amount of capital available to provide protection against catastrophic losses and infrastructure managers have limited funds to purchase insurance for catastrophic events. • It is necessary for the government to be the insurer of last resort when a community suffers a truly catastrophic event. • However, adjustments to the Stafford Act funding process (e.g. deductible prior to public funding; private insurance to cover the first portion of losses above deductible) could encourage improvements in resilience and insurance coverage and reduce reliance on government funds.
<p>2. Promote alternative funding vehicles for pre-event resiliency investment that are linked to insurance premium discounts</p>	<ul style="list-style-type: none"> • Immediate day-to-day operational and maintenance funding is an issue for many infrastructure managers. These entities struggle with how to provide funding for longer-term resiliency efforts pre-event. • Low interest loans for resiliency improvements could be an option that government could offer. • The affordability of a resiliency improvement could be enhanced by reduced insurance premiums associated with the resiliency measure.
<p>3. Facilitate catastrophic risk data collection, availability, and analysis</p>	<ul style="list-style-type: none"> • Insurers and infrastructure managers alike noted difficulties due to insufficient data in relating resilience improvements to insurance premiums and cost savings. • Data acquisition, sharing, and analysis is needed to enable quantification of the benefits associated with resilience improvements. • Individual insurers and infrastructure managers are not in a position to obtain and synthesize these data, since the data span multiple companies and infrastructure authorities. • The need for data and development of public loss models for infrastructure is particularly critical in the realm of cyber risk.

<p>4. Encourage the development of risk transfer/resilience metrics</p>	<ul style="list-style-type: none"> • Metrics pertaining to system characteristics and maintenance would assist insurers with evaluating and comparing infrastructure systems and with implementing risk based pricing. • Financial and insurance related metrics, along with organizational, emergency response, and robustness and redundancy metrics, would assist infrastructure managers with assessing their financial readiness to deal with a catastrophic disruption, and with evaluating and choosing resilience measures and insurance needs.
<p>5. Support research pertaining to emerging catastrophic risks such as cyber</p>	<ul style="list-style-type: none"> • Uncertainty and data unavailability for emerging risks limit insurance and resilience measures. • Emerging risks of key concern involve cyber, terrorism, and climate.
<p>6. Consider a redefinition of terrorism for coverage under the Terrorism Risk Insurance Act (TRIA)</p>	<ul style="list-style-type: none"> • TRIA coverage only applies to events that are officially deemed as terrorism events, leaving many terrorism-like events uncovered. • Some infrastructure managers opt out of TRIA coverage because events of most concern to their facilities are generally not classified as terrorism events under TRIA. • Broader coverage under TRIA could potentially expand the interest in and purchase of terrorism coverage.
<p>7. Inform infrastructure managers of the comprehensive operational benefits of catastrophic risk insurance coverage beyond a straightforward loss backstop</p>	<ul style="list-style-type: none"> • In addition to providing financial security for infrastructure systems, insurance often provides additional benefits stemming from a comprehensive modeling and assessment of risk and access to other risk transfer financing mechanisms. • These benefits have the potential to significantly impact the resilience of infrastructure systems in the United States.

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For more detailed information about this project, please refer to the following sources, which can be found at <http://opim.wharton.upenn.edu/risk/papers/>.

Kunreuther, H., Michel-Kerjan, E., and Tonn, G. Insurance, Economic Incentives, and Other Policy Tools for Strengthening Critical Infrastructure Resilience: 20 Proposals for Action. December 2016.

Czajkowski, J., Kunreuther, H., and Tonn, G. Identifying and Reducing Barriers to Catastrophic Risk Insurance: Transportation Infrastructure Systems. July 2017.

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About the Wharton Risk Center

Established in 1985, the **Wharton Risk Management and Decision Processes Center** develops and promotes effective corporate and public policies for dealing with catastrophic events including natural disasters, technological hazards, terrorism, pandemics and other crises. The Risk Center research team – over 70 faculty, fellows and doctoral students – investigate how individuals and organizations make choices under conditions of risk and uncertainty under various regulatory and market conditions, and the effectiveness of strategies such as alternative risk financing, incentive systems, insurance, regulation, and public-private collaborations at a national and international scale. The Center actively engages multiple viewpoints, including top representatives from industry, government, international organizations, interest groups and academia. More information is available at <https://riskcenter.wharton.upenn.edu>.

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