



補修・補強の優先度・説明責任

材料劣化への対処か？ 耐震補強か？

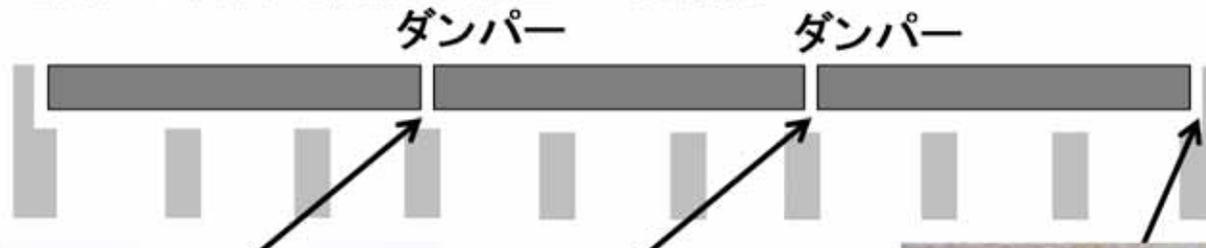
予算Bが与えられたとき、要求性能を満足しなくなる状況を避けるには何をすべきか？

$$\text{Seismic Risk} \begin{matrix} \leq \\ \equiv \\ > \end{matrix} \text{Risk Associated with Material Deterioration}$$

検討項目

⇒橋梁の重要度・建設年代・破壊の脆弱性・地震ハザード・劣化の進行度・腐食環境

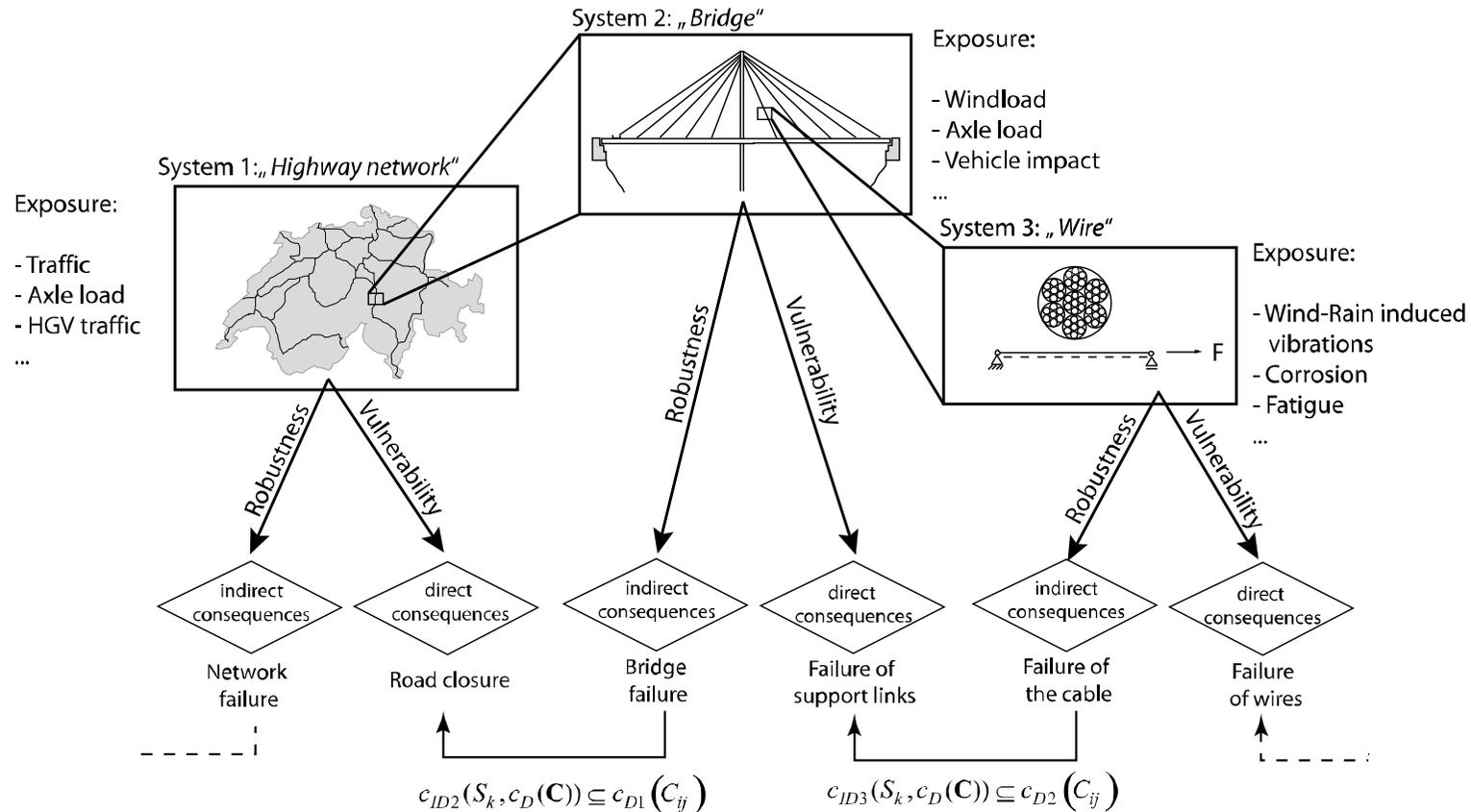
東北地方太平洋沖地震後に調査した道路橋



維持管理・補強・更新・廃棄？



予算は限定 膨大な既存インフラが存在 我が国は地震国



- ネットワーク全体を俯瞰した優先度判定(耐震補強, 劣化対策, 更新, 廃棄の判断)が必要



国民の理解を得る努力



アメリカ土木学会 (ASCE) の例 (4年に一度, 情報を更新)

2013 | REPORT CARD | for AMERICA'S INFRASTRUCTURE

ASCE
AMERICAN SOCIETY OF CIVIL ENGINEERS

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AMERICA'S GPA: **D⁺**

The American Society of Civil Engineers is committed to protecting the health, safety, and welfare of the public, and as such, is equally committed to improving the nation's public infrastructure. To achieve that goal, the Report Card depicts the condition and performance of the nation's infrastructure in the familiar form of a school report card—assigning letter grades that are based on physical condition and needed fiscal investments for improvement.

ESTIMATED INVESTMENT NEEDED BY 2020:
\$3.6 TRILLION

2020年までに3.6兆ドルの投資が必要と試算
ホームページ公開・学会等で発表



Waseda University

国民の理解を得る努力



2010 Report Card for Pennsylvania's Infrastructure Keystone In Crisis

Home Infrastructure Grades Behind the Grid More Resources 2010 Report Card



Infrastructure Grades

<p>Bridges Of Pennsylvania's 12,000 bridges, 27% are considered structurally deficient and 17% are deemed functionally obsolete. These figures mean increased traffic congestion as well as forcing emergency vehicles to take lengthy detours due to closed or single-lane bridges. Pennsylvania's progress on bridge repair through their accelerated bridge program has allowed these numbers to not increase, despite the increasing age of the Commonwealth's bridge inventory. Further progress on the bridge program and proper funding of bridge replacement and maintenance on the part of PA is a positive direction. However, the heavily aged and aging program means the Commonwealth's aging infrastructure is a real concern for the state's economy and funding to state's critical infrastructure needs, including its own's' immediate, needed bridge repair.</p> <p>See the full report.</p>	C
<p>Dams and Levees Due to the abandonment of the Pennsylvania Department of Environmental Protection (PA DEP) program in the late 1970s, Pennsylvania has remained ahead of other states in dam safety. However, about 20% of the state's high hazard dams—dams whose failure could cause serious loss of human life and substantial property damage—are considered deficient. The estimated cost to repair Pennsylvania dams projected to be fully deficient over the next five years is more than \$1.4 billion. There are 65 levee systems in Pennsylvania, and the average age of these systems is 40 years, about double the age of other states. The advanced age of the levee systems may cause them to be unable to perform without failure.</p> <p>See the full report.</p>	C-
<p>Drinking Water Pennsylvania's water treatment plants are among the best in the nation, with many water utilities, through advanced treatment technology, meeting water quality and consumption of less than one gallon per day. However, the number of drinking water systems in violation of regulations is on the rise. Funding, research, the use of advanced treatment technology, and meeting water quality and consumption of less than one gallon per day are a steady source of funding. Drinking water systems that pass federal drinking water quality to reflect conditions and maintenance costs as well as being ready for natural disasters. If funding needs are not met, the state face violating the SDWA, environmental and economic gains that have been made over the last three decades.</p> <p>See the full report.</p>	D+
<p>Navigable Waterways The average time of response for Pennsylvania is 1.25, or a 1.5, and there is no program, department, strategy for aging, obsolete infrastructure, safety, security, and environmental threats from any categories. Much work is needed, resulting in a lot of commercial shipping in affected channels, serious water quality degradation, loss of recreational and aesthetic value. Large bridges on these water and infrastructure is by far the most economical and environmentally friendly mode of transportation, but the infrastructure investment program built over the last 20 years is a steady state of neglect due to lack of maintenance and adequate transportation funding.</p> <p>See the full report.</p>	D+
<p>Parks and Recreation In 2009, Pennsylvania State Parks earned the National 500th Anniversary Award for Excellence in Park and Recreation Management by the Parks Association for Parks and Recreation Administrators, recognizing the state's parks as the among the nation's best. The state also owns 10% of the nation's largest state park system, the George Washington D.C. Park System, which is one of the largest state park systems in the world. However, the state's parks are in need of funding, research, the use of advanced treatment technology, and meeting water quality and consumption of less than one gallon per day are a steady source of funding. Drinking water systems that pass federal drinking water quality to reflect conditions and maintenance costs as well as being ready for natural disasters. If funding needs are not met, the state face violating the SDWA, environmental and economic gains that have been made over the last three decades.</p> <p>See the full report.</p>	B-
<p>Freight Rail In 2009, 100% of the freight rail lines in Pennsylvania are in good condition. The state's freight rail system is a good example of how Pennsylvania's infrastructure is in good condition. However, the state's freight rail system is in need of funding, research, the use of advanced treatment technology, and meeting water quality and consumption of less than one gallon per day are a steady source of funding. Drinking water systems that pass federal drinking water quality to reflect conditions and maintenance costs as well as being ready for natural disasters. If funding needs are not met, the state face violating the SDWA, environmental and economic gains that have been made over the last three decades.</p> <p>See the full report.</p>	B
<p>Roads Pennsylvania's roads are in good condition, with 90% of the state's roads in good condition. However, the state's roads are in need of funding, research, the use of advanced treatment technology, and meeting water quality and consumption of less than one gallon per day are a steady source of funding. Drinking water systems that pass federal drinking water quality to reflect conditions and maintenance costs as well as being ready for natural disasters. If funding needs are not met, the state face violating the SDWA, environmental and economic gains that have been made over the last three decades.</p> <p>See the full report.</p>	D-
<p>Schools Pennsylvania's schools are in good condition, with 90% of the state's schools in good condition. However, the state's schools are in need of funding, research, the use of advanced treatment technology, and meeting water quality and consumption of less than one gallon per day are a steady source of funding. Drinking water systems that pass federal drinking water quality to reflect conditions and maintenance costs as well as being ready for natural disasters. If funding needs are not met, the state face violating the SDWA, environmental and economic gains that have been made over the last three decades.</p> <p>See the full report.</p>	B-
<p>Solid Waste Pennsylvania's solid waste management is in good condition, with 90% of the state's solid waste management in good condition. However, the state's solid waste management is in need of funding, research, the use of advanced treatment technology, and meeting water quality and consumption of less than one gallon per day are a steady source of funding. Drinking water systems that pass federal drinking water quality to reflect conditions and maintenance costs as well as being ready for natural disasters. If funding needs are not met, the state face violating the SDWA, environmental and economic gains that have been made over the last three decades.</p> <p>See the full report.</p>	B-
<p>Stormwater Pennsylvania's stormwater management is in good condition, with 90% of the state's stormwater management in good condition. However, the state's stormwater management is in need of funding, research, the use of advanced treatment technology, and meeting water quality and consumption of less than one gallon per day are a steady source of funding. Drinking water systems that pass federal drinking water quality to reflect conditions and maintenance costs as well as being ready for natural disasters. If funding needs are not met, the state face violating the SDWA, environmental and economic gains that have been made over the last three decades.</p> <p>See the full report.</p>	D-

まとめ

