



How well are we doing relative to other States?

Interstate Highway Bridge Spending and Performance Comparisons across the States of the Union



S.A. Ghahari, Y. Qiao, S. Labi

Lyles School of Civil Engineering, Purdue University

INTRODUCTION

- ❑ U.S. Department of Transportation and the General Accountability Office are engaged in oversight and accountability of state highway agencies.
- ❑ There is a need for regular systemwide monitoring of transportation infrastructure condition in response to highway expenditures.

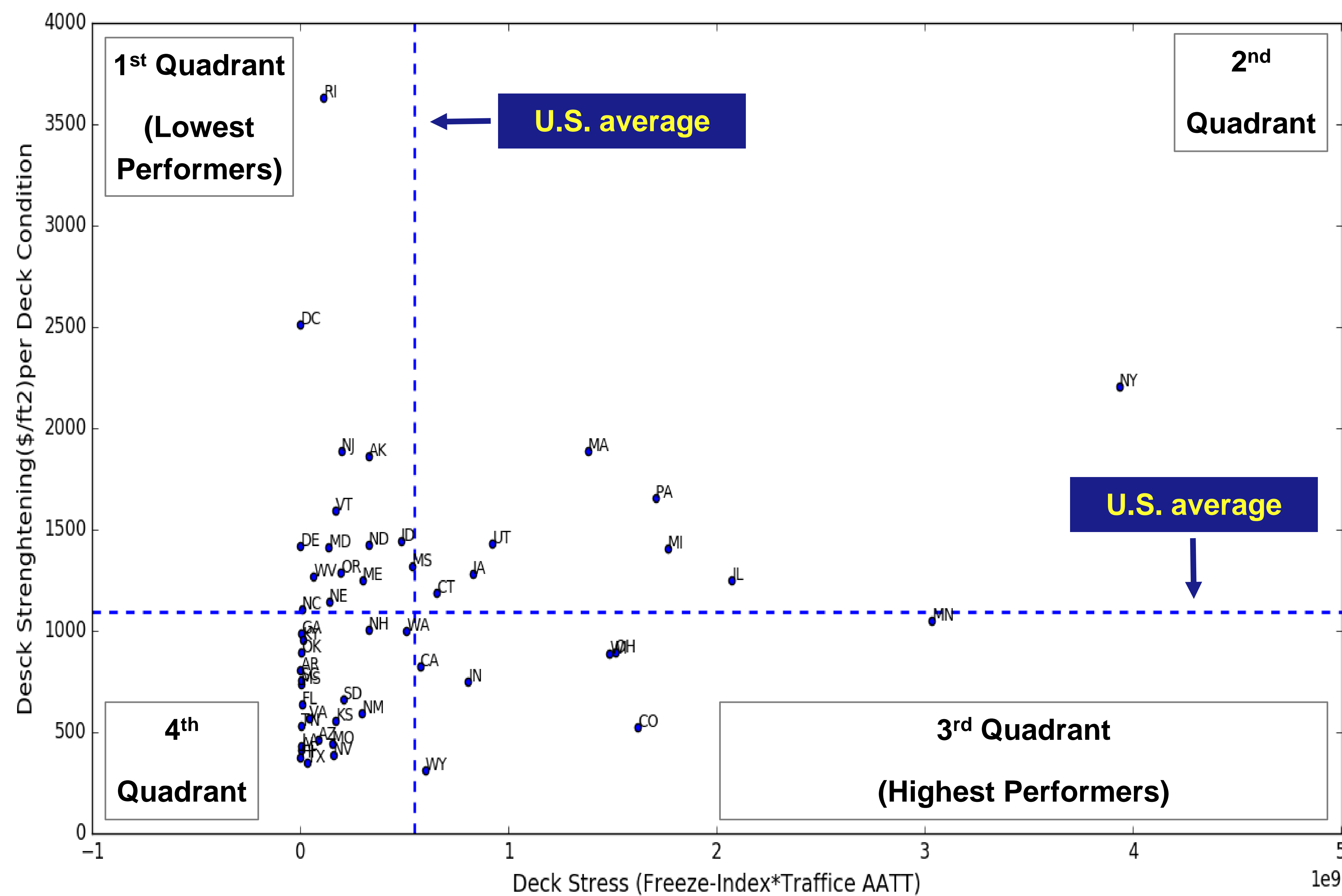
OBJECTIVES

- ❑ Need to identify high performance and low performing agencies
- ❑ Poor performance of agency could be due to:
 - Work culture
 - Poor design/construction
 - Poor materials
 - Corruption
 - Etc.
- ❑ Provide basis for recommendations for agency performance enhancement

VARIABLES

- ❑ Strength factors:
 - Total expenditure per ft² of deck
- ❑ Stress factors:
 - Traffic (truck) loads
 - Climate severity (Freeze-thaw index in deg-days)

STATISTICAL DATA



Expenditure, area of the bridge, deck condition vs. freezing index and ADTT
(Average values for 2000-2012)

RESULTS

- ❑ **Highest performers** (Little spending per ft², high deck condition, high truck traffic, severe climate)
Colorado, Minnesota, **Indiana**, Ohio, Wisconsin, Wyoming, California
- ❑ **Lowest performers** (High spending per ft², low deck condition, low truck traffic, mild climate)
New York, Idaho, Connecticut, Illinois, Massachusetts, Utah, Michigan, Pennsylvania

DISCUSSION

- ❑ Key assumptions:
 - (a) NBI data with the data spanning of 2000-2012
 - (b) 1 degree-day of FI and 1 truck have equivalent effects on deck damage
 - (c) Zero scale economies of expenditure effects on damage remediation. (Therefore, 1 \$/ft² in small state has same repair effect as 1\$/ft² in large state)

SUMMARY & FUTURE WORK

- ❑ The framework and results shows how oversight agencies can increase the overall accountability of individual highway agencies
- ❑ Offer plausible explanations of the observed differences in the resulting overall bridge condition across the states.
- ❑ Using lagged panel model specifications
- ❑ Considering site-specific design variables
- ❑ Identifying the stability of ranking
- ❑ Relaxing the assumptions
- ❑ Extend the work to superstructure and substructure

