

# HIGHWAY CONSTRUCTION COSTS

## How Does Illinois Compare?



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## HIGHWAY CONSTRUCTION COSTS: HOW DOES ILLINOIS COMPARE?

### ILEPI Economic Commentary #7

#### INTRODUCTION

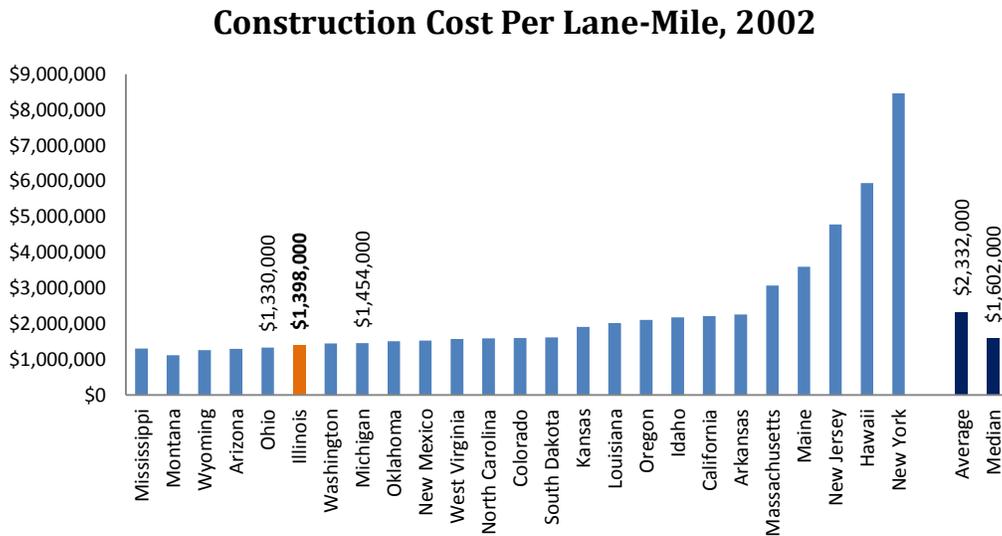
Illinois' highway network is indispensable to the state's economy. The state's expressways connect workers to jobs, reduce the business cost of transporting materials, and raise productivity. At the heart of the nation's transportation infrastructure, Illinois' highway system comprises 43,000 lane-miles of highways (including 1,900 lane-miles of interstate highways)<sup>1</sup> and 2,000 lane-miles of tollway.<sup>2</sup> Additionally, from 1990 to 2012, vehicle travel on interstate highways in Illinois grew by 25 percent while lane-miles on the system did not keep pace, increasing by only 11 percent.<sup>3</sup> This ILEPI Economic Commentary analyzes the costs of highway road construction and maintenance across states to understand how expensive updating and expanding the highway system would be to the State of Illinois.

#### CONSTRUCTION COST PER LANE-MILE OF HIGHWAY

In 2002, the Washington Department of Transportation (WSDOT) conducted a highway construction cost comparison survey for a "representative project that would be universal in all states."<sup>4</sup> A total of 25 U.S. states participated in the survey, with each providing unit costs for the major bid items in their respective states and ranges of project costs in right-of-way acquisition and environmental compliance and mitigation. The WSDOT survey found that the national average cost to construct a single lane-mile of the representative highway was \$2.33 million and that the median cost was \$1.60 million.

Illinois ranked 6<sup>th</sup> out of the 25 states in cost-effectiveness (Figure 1). At \$1.40 million per lane-mile, the highway construction cost of Illinois fell below the median state and was 40.1 percent cheaper than the national average. The state's per lane-mile cost was found to be in line with the neighboring states of Michigan (\$1.45 million) and Ohio (\$1.33 million) but significantly less than states containing comparably dense urban areas such as New York (\$8.46 million) and California (\$2.21 million).

*Figure 1: Construction Cost Per Lane-mile, 2002 State Comparison by WSDOT*



*Source: Kishore & Abraham (2009). Average and median are state-level and unweighted.*

The cost of construction on highway projects is impacted by development type. 2011 estimates of the generic cost per lane-mile to construct a new divided four lane interstate, for example, were \$0.92 million

for rural Illinois and \$1.88 million for urban areas.<sup>5</sup> In June 2011, the 6.5-mile four-lane US-67 expressway project in Morgan County in central Illinois was let by the Illinois Department of Transportation (IDOT) and had an actual cost of \$1.5 million per lane-mile.<sup>6</sup> The cost of this rural project parallels both the 2002 WSDOT study as well as the 2011 generic estimates.

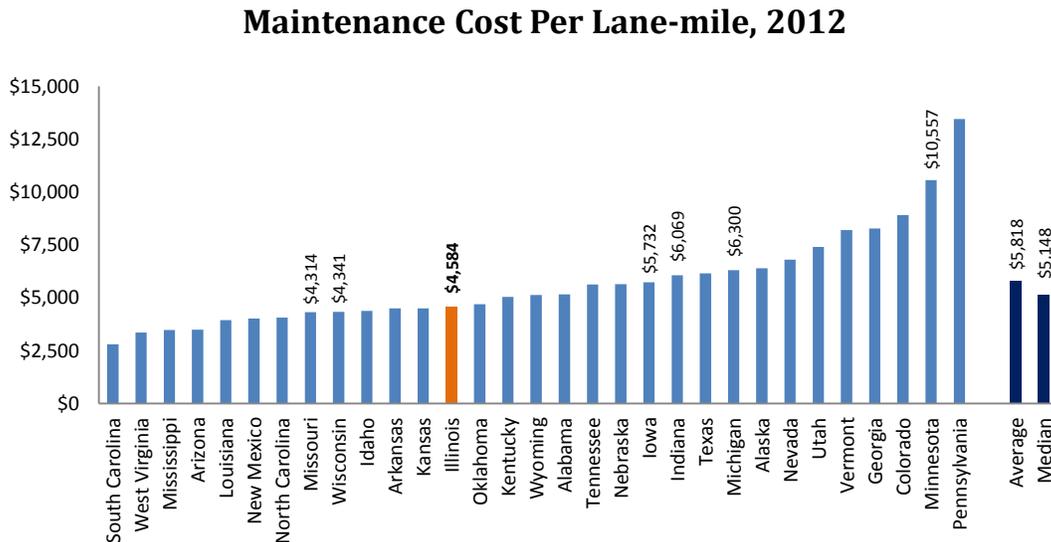
Of course, construction costs of some urban design projects can substantially exceed this average cost. The I-355 south extension cost \$18.9 million per lane-mile<sup>7</sup> and the proposed Illiana expressway is expected to cost between \$6.6 million and \$8.1 million per lane-mile.<sup>8</sup> These elevated costs, however, are the result of adjustments for urban elements such as wider travel lanes, overpass bridge construction, urban interchange signalization, closed drainage systems, and toll collection systems and *should not* be considered representative of the typical per lane-mile cost of highway construction for Illinois.

**MAINTENANCE COST PER LANE-MILE OF HIGHWAY**

In 2012, the Indiana Department of Transportation (INDOT) conducted a state-to-state highway maintenance cost comparison survey.<sup>9</sup> A total of 33 U.S. states responded to the survey and self-reported their estimated maintenance costs per lane-mile based on criteria provided by INDOT. The survey found that the national average cost to maintain a single lane-mile of highway was \$5,818 and that the median cost was \$5,148 per lane-mile.

Illinois ranked 13<sup>th</sup> out of the 33 states in cost-effectiveness (Figure 2). Like the cost of new construction, the cost of highway maintenance was below both the median state and the national average. At \$4,584 per lane-mile, Illinois’ highway maintenance costs were 21.2 percent cheaper than the national average. Illinois’ maintenance costs are also low compared to neighboring states. Only Missouri (\$4,314) and Wisconsin (\$4,341) reported cheaper maintenance costs, but they were considerably higher in Iowa (\$5,732), Indiana (\$6,069), Michigan (\$6,300), and Minnesota (\$10,557). Additionally, except for Idaho and Wisconsin, all of the states with lower average lane-mile maintenance costs were warmer weather states.

*Figure 2: Maintenance Cost Per Lane-mile, 2012 State Comparison by INDOT*



*Source: Wisconsin Department of Transportation (2012). Average and median are state-level and unweighted.*

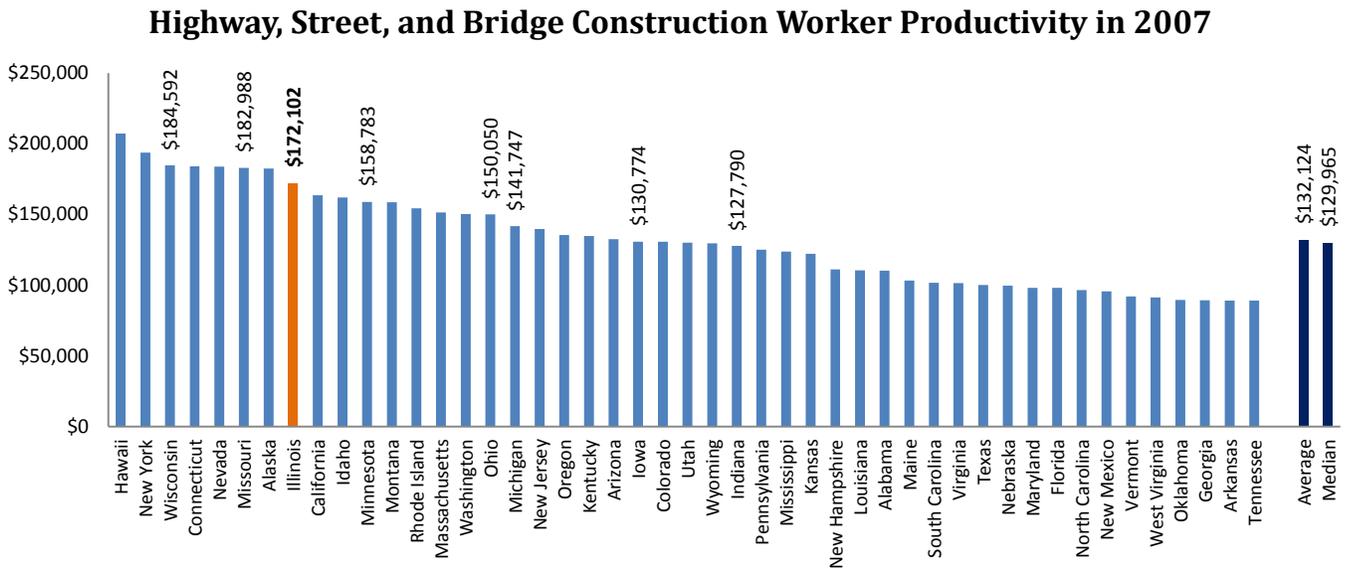
**VALUE ADDED PER WORKER IN HIGHWAY, STREET, AND BRIDGE CONSTRUCTION**

While costs are an important part of the equation for taxpayers, the productivity of the highway construction and maintenance industry is also vital. Figure 3 provides state-level data on the value added

by workers in the “highway, street, and bridge construction” sector of the construction industry in America. “Value added”— which measures worker productivity over one year— is business revenues minus the costs for materials, components, supplies, fuels, and subcontracted work. Information is from the 2007 Economic Census, the most-recent year for which data are available, and includes 47 states (there was not enough data from Delaware, North Dakota, and South Dakota).<sup>10</sup>

Out of the 47 states with available data, Illinois ranked 8<sup>th</sup> in value added per worker for highway, street, and bridge construction (Figure 3). In this sector, Illinois workers each generated \$172,102 worth of economic revenue on average in 2007. Illinois worker productivity is 30.3 percent higher than the national average of \$132,124 per worker and surpasses the median state (\$129,965). Worker productivity in Illinois is slightly below the bordering states of Wisconsin (\$184,592) and Missouri (\$182,988) but well above every other nearby state, including Iowa (\$130,774) and Indiana (\$127,790).

*Figure 3: Value Added Per Worker in Highway, Street, and Bridge Construction, 2007 Economic Census*



*Source: Author’s analysis of the 2007 Economic Census. Average and median are state-level and unweighted.*

### CONCLUSION AND POLICY RECOMMENDATION

To address the deteriorating condition of the state’s infrastructure, meet the growing demand by businesses and families for improved mobility, and boost the economy for long-term success, Illinois needs to invest in updating and expanding its highways. Increased expenditure on the state’s highway system is a worthwhile public investment because:

- Construction costs per lane-mile are 40.1 percent cheaper in Illinois than the national average;
- Maintenance costs per lane-mile are 21.2 percent cheaper in Illinois than the national average; and
- Illinois workers in “highway, street, and bridge construction” are 30.3 percent more productive than the national average for comparable workers.

Ultimately, these estimates reveal that, while per lane-mile costs are relatively low on average for the Illinois highway system, the benefits of road infrastructure to the state economy are substantial and exceed the national average. Infrastructure investment in Illinois needs to be both increased and sustained over time.

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ENDNOTES

<sup>1</sup> Illinois Department of Transportation (IDOT). (March 2012). “Transforming Transportation for Tomorrow: FY 2013 – 2018 Proposed Multi-Modal Transportation Improvement Program.” Available at <https://www.dot.il.gov/hip1318/html/district/mtip.pdf>.

<sup>2</sup> American Society of Civil Engineers (ASCE). (2014). “Roads: 2014 Report Card for Illinois’ Infrastructure.” Available at <http://www.isasce.org/wp-content/uploads/2014/04/2014-Illinois-Roads-Final-Report.pdf>.

<sup>3</sup> *Ibid.* 2, ASCE.

<sup>4</sup> Kishore, Varun and Dulcy Abraham. (2009). “Construction Costs – Using Federal Vs. Local Funds.” Citing WSDOT. (2002). “Highway Construction Cost Comparison Survey.” Available at <http://docs.lib.purdue.edu/cgi/viewcontent.cgi?article=2658&context=jtrp>.

<sup>5</sup> IDOT. (2011). “Generic Cost Per Mile Models.” Estimates are adjusted to *per lane-mile* figures. Available at [http://citizensforsouthernillinois.org/wp-content/uploads/2012/02/highway\\_construction\\_costs.pdf](http://citizensforsouthernillinois.org/wp-content/uploads/2012/02/highway_construction_costs.pdf).

<sup>6</sup> IDOT. (August 2013). “IDOT Comments on July 30, 2013: CMAP Staff Evaluation Memorandum of the Illiana Corridor to the Transportation Committee.” Available at [http://www.cmap.illinois.gov/documents/10180/102498/Illinois+Department+of+Transportation+\(IDOT\)%20Illiana+response.pdf/51fe9d35-ad70-442e-91be-f7e6b7656994](http://www.cmap.illinois.gov/documents/10180/102498/Illinois+Department+of+Transportation+(IDOT)%20Illiana+response.pdf/51fe9d35-ad70-442e-91be-f7e6b7656994).

<sup>7</sup> Chicago Metropolitan Agency for Planning (CMAP). (July 2013). “Memorandum: Proposed Amendment to GO TO 2040 – Illiana Corridor.” Available at [http://www.nirpc.org/media/29595/cmap\\_staff\\_illiana\\_evaluation\\_v6\\_\\_07\\_30\\_2013.pdf](http://www.nirpc.org/media/29595/cmap_staff_illiana_evaluation_v6__07_30_2013.pdf).

<sup>8</sup> *Ibid.* 6. IDOT.

<sup>9</sup> Wisconsin Department of Transportation (WisDOT) Finance & Policy Commission. (2012). “State Highway Maintenance: Policy Issue Paper.” Citing INDOT. Available at <http://www.dot.wisconsin.gov/about/tfp/docs/state-highway-maint.pdf>.

<sup>10</sup> Census. (2007). “Economic Census.” United States Census Bureau. Available at [Business.Census.gov](http://Business.Census.gov).