



State of New Jersey

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CHRIS CHRISTIE
Governor

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March 20, 2015

The Honorable Amy Handlin
New Jersey General Assembly, 13th District
225 Route 35, Suite 202
Red Bank, New Jersey 07701

The Honorable Jay Webber
New Jersey General Assembly, 26th District
1055 Parsippany Blvd., Suite 104
Parsippany, New Jersey 07054

Dear Assemblywoman Handlin and Assemblyman Webber:

Thank you for your recent correspondence regarding the road costs per mile in the State of New Jersey. I appreciate the opportunity to be of assistance to you and your constituents.

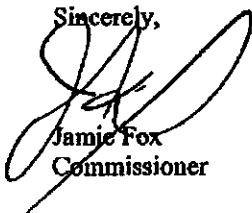
As I stated in my editorial to the Star-Ledger, the Reason Foundation's methodology in arriving at the \$2 million per center line mile cost to administer New Jersey's highway system is flawed, as this number consists of debt payments, including those attributable to mass transit projects, grants to municipalities and counties for local infrastructure not under the jurisdiction of the state and Motor Vehicle Commission fees that are not applied to New Jersey's highway infrastructure. When factoring these elements out, the cost per center line mile is \$925,704 and the cost per lane mile is \$271,433.

It is important to note that New Jersey will always rank low when utilizing the Reason Foundation methodology due to the significant debt burden placed on the Transportation Trust Fund (TTF), which is directly attributable to years of inaction by various administrations in identifying a revenue source to support transportation infrastructure investments in New Jersey.

I look forward to working with the Legislature to not only obtain a dedicated funding source for the TTF and reducing its debt burden, but also to continually explore new ways to maximize efficiency of taxpayer dollars to maintain the state's vital roadways and infrastructure.

I hope this information is helpful. If you have any further questions, please feel free to contact John M. Case, Assistant Commissioner for Government and Community Relations, at (609) 530-3686.

Sincerely,



Jamie Fox
Commissioner

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State of New Jersey

DEPARTMENT OF TRANSPORTATION
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RICHARD T. HAMMER
Acting Commissioner

CHRIS CHRISTIE
Governor

KIM GUADAGNO
Lt. Governor

May 5, 2016

The Honorable Amy Handlin
New Jersey General Assembly, 13th District
Deputy Republican Leader
225 Route 35, Suite 202
Red Bank, NJ 07701

The Honorable Jay Webber
New Jersey General Assembly, 26th District
1055 Parsippany Blvd., Suite 104
Parsippany, NJ 07054

RE: State Highway Costs – Analysis of Cost Drivers and Effectiveness

Dear Assemblywoman Handlin and Assemblyman Webber:

Thank you for your letter of March 30, 2016 concerning the cost of road construction and maintenance in New Jersey. I appreciate the opportunity to continue this dialogue regarding the Reason Foundation's Annual Highway Report series, the methodology of which has been vigorously rejected by the New Jersey Department of Transportation (NJDOT).

In short, the study is a massive oversimplification that grossly distorts the actual facts. By largely ignoring the complexities involved, it fails to satisfy normal research standards. The report does not accurately represent the cost to construct a mile of highway (as is often portrayed in the press) nor does it provide an "apples to apples" cost comparison with other states.

Please be advised that it is not only the NJDOT's view. In a March 9, 2015 news article in the Bergen Record, Doug Hecox, spokesman for the Federal Highway Administration (FHWA), noted that each state uses its own accounting system, many of which predate the interstate system, making an apples-to-apples comparison impossible.

"It would be nice if every state reported their numbers the same way. It would make things simpler. But it's not realistic," Hecox said. "Does it make things more difficult to do a national comparison? Of course."

As outlined in the enclosed attachments, the Foundation's report is chock-full of double counts, overrepresented and unrelated costs and it fails to control for unique cost drivers and accounting differences. It is a misrepresentation to simply divide total costs by road miles and is not an analysis.

For example, the study identifies Texas (11th), Missouri (12th), Georgia (13th) and Ohio (14th) as "urban" states that scored highly. It is difficult to see how this is a fair comparison. As noted in the attached chart entitled, "State Highway Agency-Owned Public Roads, 2012" (which draws from the FHWA's Highway Statistics Report), 85% of New Jersey's centerline miles are classified as "urban" while the average of the four states noted above is only 18%. Texas and North Carolina, which were highly ranked in the Foundation's 2012 study, are each credited with approximately 80,000 centerline miles of state jurisdiction roadway, however, half of Texas' miles are rural, "farm to market" roads and North Carolina has no county road system. Despite significantly higher traffic volume and the added investment required to maintain urban highways versus rural roads, the study treats all of the miles as if they are equal. This has a powerful effect on the final results. Based more on their unique history than any overt track record of efficiency, the study rates these states highly and penalizes states like New Jersey.

For purposes of illustration, if costs were instead divided by vehicle miles travelled (VMT) per lane mile, a measure that arguably carries greater significance given the relationship between road deterioration and usage, the results would be markedly different. As summarized in the attached chart entitled "Disbursements Per VMT Per Mile", New Jersey ranks 27th under this alternate approach and some states that ranked at the top of Reason Foundation's 2012 study fall to the very bottom. My point is not to suggest that a different version of an overly simple analysis is clearly better, but rather to reinforce that a proper study of cost efficiency requires a significantly higher degree of sophistication in order to be taken seriously.

Attached is a detailed list of methodological flaws in the Reason Foundation analysis and cost drivers for New Jersey that should be taken into account in any analysis. And as you requested, also attached is a list of savings and efficiency initiatives that NJDOT has undertaken to control costs and improve service. My basic intent is not to portray New Jersey as being among the least costly states for highway construction and maintenance, as that would be an unreasonable expectation. However, it is reasonable to expect that any analysis of this issue be properly structured and devote the time necessary to produce a balanced and fair review that avoids misinterpretation.

I hope this information is helpful. If you have any additional questions, please feel free to contact John Case, Assistant Commissioner for Government and Community Relations, at (609) 530-3686.

Sincerely,



Richard T. Hammer
Acting Commissioner

Attachments

Reason Foundation - Methodological Flaws

The Reason Foundation's simple methodology merely divides total highway spending by state-administered centerline highway miles. The more prominent flaws in the Foundation's study include:

- *Centerline Miles*
Using centerline miles instead of lane miles places NJ at a significant disadvantage. NJ has a small number of centerline miles (2,326) but the most "lane miles per center line mile" of any state in the nation. (Average centerline miles among other states = 15,574)
- *State Jurisdiction Roadways - Inconsistencies*
Many states count local roads as state jurisdiction. NJ does not.

All lane miles are treated equally, which distorts the results. Examples:

- Half of highly-ranked Texas' centerline miles = "farm to market" roads.
- Highly-ranked North Carolina has no county road system and counts those roads as state highway, 80% of which are rural/low traffic.

Failure to adjust for highly urban road systems:

- 85% of NJ's centerline miles are classified as "urban".
- Among four "urban" states ranked highly by the Reason Foundation (TX, MO, OH and GA), average of only 18% of miles are classified as "urban".

- *Double count: Outlays and Debt Principal*
Counts both outlays to contractors and principal payments on TFFA debt. Since the debt generates the funds to pay the contractors, Reason is double counting the same cost. (This is particularly unfair to high debt states like NJ.)
- *Refunding Bonds*
Counts refunding bond principal payments, which is similar to counting both an original mortgage and a refinanced mortgage.
 - In its 2012 study, the Foundation reported total debt service of \$3.1b for NJ, however the actual amount for NJDOT and the toll road authorities was only \$1.7b (i.e., reduction of 45%). The \$1.4b difference represented bonds refunded by the NJ Turnpike Authority.
- *Non-highway TTF Debt*
Counts the entire TFFA debt service expense, not just the portion attributable to NJ highways.
 - Of \$944m in TFFA debt in FY12, highway portion =only \$373m (41%).
- *Non - NJDOT Costs*
Routinely characterizes \$350m for the Motor Vehicle Commission (\$283m) and State Police patrols as "transportation costs", which makes little sense when considering the cost to construct and maintain a mile of road. (Also note: NJ is the only state operating a statewide vehicle emissions system.)

NJ-Specific Cost Factors

- *High Debt*
Combined debt service among NJ's transportation agencies (NJDOT, NJT, NJTA, and SJTA) is among the highest in nation.
- *Vehicle Miles Traveled (VMT)*
VMT is a better cost indicator than centerline miles, since road deterioration is based on usage. NJ's VMT per centerline mile is second highest in nation, trailing only California, and NJ's "VMT Per Lane Mile" is more than triple the national average. As a result:
 - Due to heavy traffic, most construction in NJ occurs at night, increasing costs approximately 30% over daytime work.
 - Unlike rural states, NJDOT cannot take lanes/highways out of service for extended time.
 - NJDOT incurs significant traffic control costs.
- *Population Density*
NJ is most densely populated state in nation, nearly seven times national average, and has the highest population per centerline mile in the country.
- *Utility Relocation*
Only one other state (Alaska) pays for utility relocation, which costs NJDOT approximately \$50m - \$100m annually. NJDOT has no control over utilities re: project scheduling.
- *Truck Traffic*
NJ has the second highest heavy truck volume in the nation (i.e., vehicle miles traveled/lane mile). Heavy trucks cause disproportionate damage to road infrastructure.
- *Age of Infrastructure*
NJ's transportation network is among the oldest in the US, and thus requires more repair.
 - Most states resurface their highways, but a higher percentage of NJ highways are beyond their useful life and require total reconstruction.
- *Expensive Bridge Work*
NJ has the second highest percentage of state-owned bridges per state-owned mile in the nation, more than double national average.
- *NJTA's Widening Project*
NJ Turnpike Authority spending peaked in 2012 at \$1.2b due to its massive road widening project. (Previously, from 2005 to 2011, NJTA's annual capital expenditures averaged \$531m.)
- *Other NJ Cost Factors:*
 - Cold weather (multiple freeze/thaw cycles accelerate road damage)
 - High labor and cost of living rates
 - High cost of land (i.e., right of way).

Disbursements Per VMT Per Mile

State Highway Agency-Owned Public Roads						
STATE	DVMT (in thousands)	VMT (DVMT*365)	Lane-Miles	VMT per Lane-Mile	Disbursements (for State-Administered Highways)	Disbursements per VMT per Lane-Mile
1 Hawaii	14,972	5,464,933,588	2,491	2,193,801	\$ 432,228,000	\$ 197.02
2 Rhode Island	16,658	6,080,121,398	2,887	2,106,382	\$ 594,644,000	\$ 287.31
3 Vermont	12,260	4,475,011,719	5,980	748,326	\$ 572,160,000	\$ 764.59
4 Massachusetts	84,623	30,887,238,545	9,572	3,226,713	\$ 2,472,808,000	\$ 766.36
5 Connecticut	64,596	23,577,402,213	9,832	2,397,939	\$ 1,907,200,000	\$ 795.35
6 New Hampshire	20,777	7,583,643,257	8,431	899,536	\$ 749,488,000	\$ 833.19
7 Idaho	23,082	8,425,099,307	12,288	685,629	\$ 586,147,000	\$ 854.90
8 Maryland	100,393	36,643,324,239	14,753	2,483,795	\$ 2,558,422,000	\$ 1,039.05
9 Michigan	135,328	49,394,829,840	27,434	1,800,473	\$ 1,998,033,000	\$ 1,109.73
10 Maine	28,040	10,234,616,564	17,687	578,645	\$ 686,916,000	\$ 1,187.11
11 Nebraska	33,673	12,290,501,252	22,473	546,894	\$ 668,096,000	\$ 1,221.62
12 Mississippi	62,708	22,888,578,265	27,728	825,470	\$ 1,098,717,000	\$ 1,331.02
13 Tennessee	135,832	49,578,515,903	36,974	1,340,917	\$ 1,835,430,000	\$ 1,368.79
14 Alabama	97,012	35,409,258,635	29,247	1,210,685	\$ 1,670,604,000	\$ 1,379.88
15 Nevada	31,845	11,623,382,315	13,388	868,163	\$ 1,249,752,000	\$ 1,439.54
16 Colorado	76,629	27,969,615,963	22,934	1,219,555	\$ 1,775,534,000	\$ 1,455.89
17 Iowa	52,354	19,109,217,234	22,818	837,447	\$ 1,269,899,000	\$ 1,516.39
18 South Dakota	16,723	6,103,841,111	18,013	338,864	\$ 516,998,000	\$ 1,525.68
19 Wyoming	16,866	6,155,922,667	15,972	385,414	\$ 609,572,000	\$ 1,581.61
20 Minnesota	90,159	32,908,076,022	29,297	1,123,242	\$ 1,793,463,000	\$ 1,596.68
21 Arizona	78,181	28,536,053,300	19,385	1,472,056	\$ 2,368,315,000	\$ 1,608.85
22 Oregon	53,516	19,533,292,003	18,598	1,050,294	\$ 1,757,323,000	\$ 1,673.17
23 New Mexico	42,496	15,510,943,959	29,143	532,230	\$ 917,116,000	\$ 1,723.16
24 Arkansas	68,691	25,072,218,336	37,400	670,380	\$ 1,193,517,000	\$ 1,780.35
25 Indiana	102,304	37,341,124,237	28,174	1,325,353	\$ 2,391,474,000	\$ 1,804.40
26 North Dakota	18,265	6,666,899,027	16,976	392,735	\$ 709,322,000	\$ 1,806.11
27 New Jersey	81,594	29,781,810,591	8,496	3,505,503	\$ 6,767,811,000	\$ 1,930.62
28 Utah	47,952	17,502,556,500	15,960	1,096,634	\$ 2,153,910,000	\$ 1,964.11
29 Georgia	178,403	65,117,257,947	48,415	1,344,986	\$ 2,944,354,000	\$ 2,189.13
30 Wisconsin	96,791	35,328,696,592	29,624	1,192,574	\$ 2,700,522,000	\$ 2,264.45
31 Montana	22,925	8,367,618,218	25,055	333,970	\$ 841,404,000	\$ 2,519.40
32 Alaska	9,894	3,611,305,961	11,415	316,362	\$ 805,234,000	\$ 2,545.29
33 Oklahoma	66,812	24,386,314,753	30,322	804,243	\$ 2,077,638,000	\$ 2,583.35
34 California	486,705	177,647,227,157	50,462	3,520,409	\$ 9,119,695,000	\$ 2,590.52
35 Ohio	185,096	67,559,944,433	49,381	1,368,133	\$ 3,548,696,000	\$ 2,593.82
36 Kansas	42,864	15,645,499,138	23,988	652,229	\$ 1,817,095,000	\$ 2,785.98
37 Delaware	21,082	7,694,915,765	11,807	651,732	\$ 1,888,204,000	\$ 2,897.21
38 Florida	283,971	103,649,461,200	43,195	2,399,579	\$ 6,956,076,000	\$ 2,898.87
39 Louisiana	99,764	36,413,800,348	39,194	929,060	\$ 2,761,236,000	\$ 2,972.07
40 Washington	85,515	31,213,064,151	18,422	1,694,380	\$ 5,187,497,000	\$ 3,061.59
41 Kentucky	101,997	37,228,818,411	61,858	601,840	\$ 1,976,251,000	\$ 3,283.68
42 South Carolina	119,725	43,699,557,142	90,242	484,249	\$ 1,638,550,000	\$ 3,383.69
43 Missouri	128,231	46,804,454,814	76,206	614,185	\$ 2,280,095,000	\$ 3,712.39
44 Illinois	155,898	56,902,608,955	42,122	1,350,910	\$ 5,482,470,000	\$ 4,058.35
45 New York	160,460	58,568,035,649	38,204	1,533,023	\$ 7,616,075,000	\$ 4,968.01
46 West Virginia	43,733	15,962,486,162	71,217	224,139	\$ 1,381,724,000	\$ 6,164.59
47 Pennsylvania	194,322	70,927,562,661	88,383	802,504	\$ 6,819,201,000	\$ 8,497.41
48 Virginia	157,566	57,511,427,063	126,227	455,618	\$ 4,085,842,000	\$ 8,967.70
49 North Carolina	206,115	75,232,117,544	170,546	441,125	\$ 4,206,365,000	\$ 9,535.54
50 Texas	477,718	172,542,102,558	194,954	885,042	\$ 12,639,021,000	\$ 14,280.71
District of Columbia	6,956	2,538,853,925	3,127	811,999	N/A	N/A
U.S. Total	4,935,072	1,801,301,158,536	1,868,699	963,933	\$ 132,078,139,000	\$ 137,019.97

(1) Source of data for DVMT & Lane-Miles is 2012 FHWA Table HM-81. Source of data for Disbursements is 2012 FHWA Table SF-1. See tables for additional information.

(2) "State Highway Agency-Owned Public Roads include" roadways owned by the State highway agency & exclude roadways owned by State toll, State park & other State agencies.

(3) DVMT (Daily Vehicle-Miles of Travel) does not include rural minor collector or rural/urban local functional systems.

(4) FHWA Table SF-1 is compiled from reports of State Authorities. Data for MA & NH is from 2010, data for NY is from 2011.

State Highway Agency-Owned Public Roads, 2012

	Rural Road Mileage	%	Urban Road Mileage	%	Total Mileage
Texas*	66,263	83%	14,005	17%	80,268
North Carolina**	61,937	78%	17,395	22%	79,332
Missouri***	30,928	91%	2,956	9%	33,884
Ohio	14,237	74%	4,999	26%	19,236
Georgia	13,989	78%	3,923	22%	17,912
New Jersey	347	15%	1,979	85%	2,326

**Texas has 40,932 miles of "farm to market" roads. These roads are rural, two-two lane roads used to connect urban areas.*

***North Carolina does not have county roads. Roads are either maintained by the state or a local municipality. The secondary road system, which consists of county and rural roads, is 64,522 of the state's miles.*

****Approximately 24,000 of Missouri's miles are supplementary routes used for local travel.*

NJDOT – Cost Saving Initiatives

Capital Construction

Value Engineering

NJDOT has employed Value Engineering to identify the best road design solutions and the lowest life cycle costs for construction and maintenance. Examples include re-sequencing construction staging to eliminate utility delays, basic design changes (e.g., bridge rehabilitation instead of replacement, reduce the size of interchanges, avoid right of way acquisition), and use of maintenance-free materials. In recent years, nearly \$400m in capital savings were realized on several major projects, including Route 3/46 Valley Notch Rd. at (\$76m), Rt. 3 over the Passaic River (\$92M), Rt. 52 Causeway Contract A (\$80m), Rt. 206 Bypass (\$41m), Rt. 280/21 (\$30m), and Rt. 72 Manahawkin Bay Bridge (\$55m).

Job Order Contracting

Based on a pilot project implemented in FY2015, NJDOT's Job Order Contracting (JOC) program reduced the cost of bridge maintenance projects by 9% to 20% versus traditional contracting methods, including expensive "if and where directed" contracts. Instead of paying cost premiums to have contractors available on a contingency basis, JOC establishes a catalog of pre-set prices and contractors compete primarily on the bid factor for profit. Contractors are incentivized to complete jobs quickly so they can move on to the next project. NJDOT will expand JOC to Intelligent Transportation Systems (ITS) in the future.

Utility Relocation

Pending legislation would provide NJDOT with greater scheduling control of utility relocations. NJ is one of a select few states in the country that pays this cost, which averages approximately \$50m annually, and the lack of control over scheduling is a key cost driver.

In-House vs. Consultant

Cost analysis confirms that consultant salaries, overhead and profit margins consistently exceed NJDOT's in-house staff salaries, fringe, and indirect costs in construction inspection, where in-house charges are 31% (\$123,000 per contract) less, design (17% less, or \$90,000 per contract), and bridge inspection (27% less, or roughly \$1,000 per contract). NJDOT is gradually increasing its in-house effort.

Pavement Preservation

Pavement preservation techniques such as thin overlays, slurry seals, microsurfacing, and in-place recycling to extend the life of a pavement by 5 to 10 years at a reasonable price. Pavement preservation projects cost approximately half (\$160,000/lane mile) of traditional pavement resurfacing (\$300,000/lane mile), and represent just over 10% of the cost of a major reconstruction (\$1,250,000/lane mile).

Pulaski Skyway – Traffic Control

NJDOT's traffic control plan for the Pulaski Skyway project not only avoided massive congestion delays but also the additional capital costs that would have accrued if project schedules were lengthened to accommodate detours. The ability to temporarily close individual lanes is a key component of that project. For example, closing the northbound lanes and essentially building the deck one half at a time saved about \$300 million versus a conventionally-staged deck replacement.

Modernized Traffic Signals

To improve traffic conditions and reduce congestion, NJDOT is gradually modernizing traffic signals on state highways, including adaptive signal systems that use computers to regulate signals based on actual traffic conditions. Travel time reductions of up to 20% have been experienced on Routes 1 and 130. This investment, which is largely federally-funded, is a low cost way to maximize NJ's existing highway capacity and thus avoid higher costs for highway expansion.

Technology – Ground Penetrating Radar

NJDOT uses Ground Penetrating Radar (GPR) to more efficiently locate underground utilities, thus avoiding costly field changes and schedule delays. GPR is also used to map areas of active corrosion and voids within bridge decks, up to \$30,000 per application. In the aftermath of Superstorm Sandy, GPR was used extensively on the reconstruction of Rt. 35, yielding considerable savings.

Asset Management

In selecting capital projects, NJDOT employs Asset Management techniques to ensure the most cost effective solutions for NJ's infrastructure needs. As opposed to a "worst first" approach, it is more cost effective to invest enough funds to keep assets in a state of good repair rather than letting them deteriorate. By investing a greater share of resources to maintain assets that are in fair condition, NJDOT arrests the rate of deterioration and thus avoids significantly larger costs in the future, when the asset would be in far worse condition. NJDOT uses this strategy to prioritize infrastructure projects, particularly pavement and bridges.

Prompt Payment Interest

Each year, NJDOT pays approximately 30,000 invoices with an approximate value of \$1.6 billion and must do so within 30 days to avoid prompt payment interest charges. Through a series of management improvements and monitoring techniques, prompt payment charges declined by 45% from fiscal years 2010 through 2015. As to the average turnaround time:

- Prompt payments to consultants dropped by over 50% since 2010, from 41 days to 18 days.
- Prompt payments to contractors dropped by 23%, from 22 days to 13 days.
- Consultant vouchers requiring more than 45 days to process dropped over 90% (from 3,828 to 333), while contractor vouchers requiring 30 days or more dropped by 95% (from 338 to only 17.)

Maximizing Federal Funds

- Federal Inactive Projects
 - In FY2015 and FY2016 to date, NJDOT's aggressive effort to closeout inactive projects has deobligated \$22m of dormant federal funds and redirected it to active use on other important projects.
- Redistributed Federal Grants
 - In the past two fiscal years, NJDOT secured a total of \$58m in underutilized federal funds redistributed from other states, including \$11m in FY14 and \$47m in FY15.

Maintenance

Safety Service Patrols – State Farm

Since FY13, DOT has received \$1.8m per year in sponsorship revenue from State Farm Insurance in support of this program, which assists disabled vehicles on State highways, thus enabling NJDOT to redirect a like amount of federal funds to support capital projects.

Maintenance Crew Re-organization

NJDOT recently re-organized its maintenance forces, shifting from specialized crews (e.g., landscaping) and instead forming larger units that are trained and equipped to perform all road maintenance functions. The total number of crews was reduced from 79 to 66 but the average crew size increased from 8 to 10 employees. Besides accelerating responsiveness in fixing an array of maintenance problems more quickly, this initiative will enable NJDOT to gradually reduce the use of high-cost contractor services in areas such as vegetation control and minor concrete repair and instead perform more of that work with in-house staff.