

# ROADS

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## 2010 Report Card for Pennsylvania's Infrastructure

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*Infrastructure investment fueled America's economic growth through the last half of the 20<sup>th</sup> century, but that capacity has been exhausted, and the results can be seen in the condition of the state's roads. International Roughness Index statistics show that 38 percent of Pennsylvania's roads are rated fair or poor. Pennsylvania's highway network, which is comprised of 40,000 state and 76,000 local miles, ranks as fifth largest in the nation for the number of state-owned highways. Truck traffic on Pennsylvania's 1,754 miles of interstate roads, including the turnpike, is more than double the national average and many of the state's roads are at or have exceeded their design capacity. Although the recent economic challenges have resulted in a leveling in travel demand on roadways, temporarily reducing the rate of increase of congestion and travel time, that demand is predicted to rise greatly in the near future. And while the American Recovery and Reinvestment Act of 2009 (ARRA) has provided more than \$600 million for road projects in Pennsylvania, this one-time funding allocation does not cover the amount required even to maintain our state's roads adequately for a single year.*

### BACKGROUND

Pennsylvania's highway system was created in 1911 under the direction of the Sproul Act, with 8,835 miles of highway falling under the control of the Department of Highways. The greatest growth in the system occurred in 1931 when the Penrose Rural Roads Act gave control of another 20,156 miles of rural roads to the commonwealth.

Another large expansion of the highway system occurred between the 1950s and the 1980s, when the interstate highway system was built, comprising 1,750 miles of the Pennsylvania highway system.

Pennsylvania's highway network is currently comprised of 40,000 state and 76,000 local miles and ranks as fifth largest in the nation for the number of state-owned highways. Truck traffic on Pennsylvania's 1,754 miles of interstate roads is more than double the national average.

The need for maintaining this huge existing system is a constant challenge. Simply keeping the road system from degrading, let alone improving it, requires more than is currently available in the budget. In 2006, the Transportation Funding and Reform Commission estimated the transportation funding gap at \$1.5 billion per year for incremental improvement and very limited capacity expansion projects, and \$2.1 billion per year for improved mobility, including limited capacity expansion projects.

Act 44 passed the Pennsylvania legislature in July 2007, establishing a long-term funding stream to help address Pennsylvania's transportation funding crisis. Based on traffic and revenue forecasts, the act was intended to provide minimum payments to the Pennsylvania Department of Transportation (PennDOT) from the Pennsylvania Turnpike Commission of \$83.3

billion over a 50-year period for transportation maintenance and improvements in Pennsylvania by converting I-80 to a tolled facility.

However, as of April 6, 2010, the federal government rejected Pennsylvania's application to convert I-80 to a toll road, leaving a funding gap of more than \$450 billion in the transportation budget. While other provisions of Act 44 have provided more than \$2 billion in transportation funding, revenues will drop sharply as of July 2010. The Pennsylvania Legislature is now faced with the task of coming up with new sources of funding to cover the critically underfunded transportation needs of the state.

In addition, the most recent six-year federal surface transportation authorization, SAFETEA-LU, expired in October 2009 and has yet to be reauthorized. Currently, the federal government is working under continuing resolutions which provide roughly 30 percent less funding and no recognition of changing conditions in the transportation infrastructure climate, not even construction cost inflation.

## CONDITIONS

Poor roadways affect the quality of and the amount of time we spend traveling, the cost of nearly every product we buy and our environment and safety.

Currently, many miles of the commonwealth's roads are at or exceeding their capacities and that number is projected to increase over the next 10 years. As a result, average commute times in congested urban areas are expected to increase.

Road condition ratings are derived using the International Roughness Index (IRI). States are required to report IRI data for the interstate system, other principal arterials, rural minor arterials and the National Highway System to the Federal Highway Administration (FHWA). Pavement rating data are not reported for local or rural minor collector functional systems.

Pennsylvania's road conditions are based on ratings of excellent, good, fair and poor. The ratings are based on the Poister Report, which was prepared by Dr. Theodore Poister from Georgia State University. The report assessed ride quality in terms of customer satisfaction. The table numbered 3 below relates the IRI Ranges (in inches per mile) to the rating category for different roadway classifications. The "excellent" threshold values represent 90 percent customer satisfaction levels for each network, while the "good" threshold values represent approximately 70 percent customer satisfaction. Unfortunately, pavement conditions are not uniformly reported from state to state. Pennsylvania includes the effect of bridge approaches and decks which, due to the expansion/contraction characteristics, frequently include a bump or jolt.

**Table 3: IRI Ranking Categories**

IRI Ranges (inches per mile)	National Highway System		Non-National Highway System	
	Interstate	Non-Interstate	ADT $\geq$ 2000	ADT < 2000
$\leq 70$	Excellent	Excellent	Excellent	Excellent
71-75	Good	Excellent	Excellent	Excellent
76-100		Good		
101-120	Fair	Good	Good	Good
121-150		Fair		
151-170	Poor	Poor	Fair	Fair
171-195			Poor	Fair
196-220			Poor	Poor
>220				

**Table 4** is from PennDot's "2008 State of Pavement Smoothness Report" and provides a breakdown by PennDOT district, as well as a statewide comparison of the pavement conditions between 2004 and 2008.

Engineering District	Year	Excellent		Good		Fair		Poor		Total		
		# of Miles	% of Miles	# of Miles Tested	%	# of Miles						
District 1-0	2008	282	84%	43	13%	10	3%	2	1%	337	100%	337
	2007	257	76%	58	17%	19	6%	3	1%	337	100%	337
	2006	254	75%	70	21%	10	3%	3	1%	337	100%	337
	2005	246	73%	67	20%	20	6%	3	1%	337	100%	337
	2004	222	68%	86	27%	14	4%	3	1%	325	96%	337
District 2-0	2008	114	58%	51	26%	28	14%	4	2%	197	100%	197
	2007	115	58%	57	29%	23	12%	2	1%	197	100%	197
	2006	83	42%	73	37%	30	15%	10	5%	197	100%	197
	2005	82	41%	72	36%	31	16%	13	7%	197	100%	197
	2004	84	44%	60	32%	31	17%	13	7%	188	95%	197
District 3-0	2008	126	78%	32	20%	3	2%	1	0%	162	100%	163
	2007	121	74%	34	21%	7	4%	1	0%	162	100%	163
	2006	109	67%	34	21%	18	11%	2	1%	163	100%	163
	2005	91	56%	35	22%	33	20%	3	2%	163	100%	163
	2004	74	51%	39	27%	30	21%	2	2%	146	90%	163
District 4-0	2008	130	35%	112	30%	112	30%	15	4%	368	100%	368
	2007	111	30%	110	30%	127	35%	19	5%	367	100%	368
	2006	106	29%	109	30%	137	37%	13	4%	366	99%	368
	2005	84	23%	120	33%	150	41%	14	4%	368	100%	368
	2004	74	20%	135	37%	150	41%	7	2%	366	99%	368
District 5-0	2008	127	37%	103	30%	95	28%	20	6%	345	100%	345
	2007	72	21%	134	39%	111	32%	27	8%	344	100%	345
	2006	49	15%	128	38%	127	38%	30	9%	333	97%	345
	2005	45	14%	128	38%	121	36%	40	12%	334	97%	345
	2004	43	13%	126	37%	130	39%	38	11%	337	98%	345
District 6-0	2008	63	34%	53	28%	49	26%	22	12%	186	100%	186
	2007	45	24%	54	29%	58	31%	28	15%	185	99%	186
	2006	31	17%	47	26%	73	40%	33	18%	184	99%	186
	2005	23	12%	55	29%	77	41%	32	17%	186	100%	186
	2004	8	4%	59	32%	88	48%	28	15%	182	98%	186
District 8-0	2008	197	62%	80	25%	34	11%	6	2%	317	100%	318
	2007	165	52%	57	27%	58	18%	7	2%	317	100%	318
	2006	168	53%	84	26%	59	19%	7	2%	318	100%	318
	2005	143	46%	95	30%	69	22%	5	2%	313	98%	318
	2004	121	41%	90	30%	73	25%	11	4%	295	93%	318
District 9-0	2008	73	49%	58	39%	15	10%	4	2%	150	94%	158
	2007	34	23%	66	45%	44	30%	4	3%	148	93%	158
	2006	27	18%	67	45%	48	33%	6	4%	147	99%	149
	2005	24	18%	66	47%	46	33%	4	3%	140	94%	149
	2004	24	17%	62	43%	52	36%	7	5%	144	97%	149
District 10-0	2008	130	80%	20	12%	10	6%	2	1%	162	100%	162
	2007	132	82%	18	11%	9	5%	2	1%	162	100%	162
	2006	133	82%	19	12%	8	5%	1	1%	162	100%	162
	2005	119	74%	30	19%	12	7%	1	0%	162	100%	162
	2004	93	62%	42	28%	14	9%	1	1%	150	92%	162
District 11-0	2008	67	48%	26	19%	37	27%	8	6%	138	100%	138
	2007	50	36%	33	25%	43	32%	10	7%	136	92%	148
	2006	46	33%	31	22%	36	26%	25	18%	138	100%	138
	2005	36	26%	32	23%	36	26%	34	25%	138	100%	138
	2004	26	20%	35	26%	38	29%	35	26%	134	98%	138
District 12-0	2008	111	54%	55	26%	39	19%	2	1%	207	100%	207
	2007	92	45%	60	29%	51	25%	3	2%	206	100%	207
	2006	100	49%	64	31%	40	19%	3	1%	207	100%	207
	2005	91	44%	67	32%	47	23%	2	1%	207	100%	207
	2004	88	42%	60	29%	47	23%	12	6%	207	100%	207
Statewide	2008	1,419	55%	633	25%	433	17%	85	3%	2,569	100%	2,580
	2007	1,195	47%	710	28%	550	21%	107	4%	2,561	99%	2,590
	2006	1,107	43%	725	28%	588	23%	133	5%	2,552	99%	2,570
	2005	985	39%	767	30%	642	25%	151	6%	2,545	99%	2,570
	2004	856	35%	794	32%	667	27%	157	6%	2,474	96%	2,570

Over the past decade the discrepancy between the national average and Pennsylvania's roads has been reduced, even considering that Pennsylvania has some of the oldest highways in the nation. In fact, the Pennsylvania Turnpike is considered the first U.S. interstate. Pennsylvania also has more miles than nearly any other state that must deal with severe winters. Pavements are susceptible to cracking and expanding due to the temperature and weather changes (freeze/thaw cycles). Also, the chemicals used during snowy/icy conditions decrease the life of a pavement when compared to more temperate states.

The continued increases in the number of trucks and their axle loads on the roads will increase the rate of roadway degradation. While deterioration of pavements is expected and monitored, a proactive response is necessary to maintain and improve ride quality.

One key to a successful roadway infrastructure program is to have sufficient funds to support roadway construction, maintenance, rehabilitation and emergency situations. PennDOT has shifted their focus to roadway maintenance and drastically cut the construction of new roadway miles. The financial limitations have created a challenge to providing accessibility for roadway users while maintaining roadway structural integrity and safety. Below is a table indicating funding levels since 2000.

### TOTAL TRANSPORTATION HIGHWAY FUNDING

(dollar amounts in millions)

<u>Fiscal Year</u>	<u>State Funding</u>	<u>Federal Funding</u>	<u>Total Funding</u>
00-01	\$2,943	\$1,112	\$4,055
01-02	\$2,940	\$1,272	\$4,212
02-03	\$2,949	\$1,265	\$4,214
03-04	\$2,966	\$1,205	\$4,171
04-05	\$3,124	\$1,081	\$4,205
05-06	\$3,566	\$1,226	\$4,792
06-07	\$3,772	\$1,273	\$5,045
07-08	\$3,942	\$1,312	\$5,254
08-09	\$4,015	\$1,354	\$5,369
09-10	\$4,164	\$2,186	\$6,350
10-11	\$4,119	\$1,914	\$6,033

As the table indicates, state transportation funding has generally increased over the past decade, with a spike in 2009 due to the ARRA.

## POLICY OPTIONS

### Funding for 2010 and Beyond

A number of challenges limit adequate funding of Pennsylvania's roads:

- The recently enacted 2009-2010 Pennsylvania budget reduced transportation spending 6 percent from the 2008-2009 budget;<sup>i</sup>
- A large portion of the Pennsylvania Act 44 funding stream slated to be derived from the tolling of I-80 is now lost due to the federal government's denial of the tolling application; and

- Reauthorization of the expired federal transportation program is lagging in the U.S. Congress.

Accessibility, structural integrity, and safety are priorities set forth for roads and bridges in Pennsylvania. The Safe, Accountable, Flexible, Efficient Transportation Act, A Legacy for Users (SAFETEA-LU) program is the federal law that dictates the funding levels and policies for the Interstate Highway System. Revenues generated by the federal motor fuels user fee flow into the Highway Trust Fund and are distributed to states from the U.S. Department of Transportation.. This program's authorization expired in September 2009 and has been maintained with extensions, but not with an updated six-year program. The funding levels from SAFETEA-LU and those currently available in the Highway Trust Fund are not adequate to maintain and improve our roadway system.

Pennsylvania passed Act 44 in 2006, which created mechanisms to provide funding for roadways, bridges and mass transit from state sources. But as of April 6, 2010, the federal government rejected Pennsylvania's application to convert I-80 to a toll road. This will create a funding gap of more than \$450 billion annually in the state's transportation budget. More than 20 major transportation projects are now on hold and Governor Rendell anticipates holding a special session of the Legislature to discuss possible solutions.

Other sources of funding that have been discussed are increases to registration and licensing fees and an increase to the state motor fuels user fee. Recent proposals for gas tax increases have not been able to garner enough political support to become a reality. Until another major source of funding is agreed upon, however, the state's ability to maintain the existing roadway system will be severely affected.

## RECOMMENDATIONS

A new approach to road infrastructure funding is needed, one in which we think of the solution as a long-term investment, not merely a one-time cost. The long-term solution to maintaining and improving Pennsylvania's roads must be comprehensive and should include the following considerations:

- Fewer fatalities;
- Smoother, stronger and longer-lasting pavements;
- Better accommodations for commercial vehicles, including seamless intermodal freight movement; and,
- Reduced commuting time and congestion.

A well-considered and comprehensive transportation solution will position Pennsylvania to maintain a high quality of life for state residents, increase the number of jobs, attract high-tech industries, improve mobility of goods and services through Pennsylvania to support domestic commerce, and be more competitive in the global market.

### **Specific Recommendations Supported by the Pennsylvania sections of the American Society of Civil Engineers:**

- Obtain stable highway maintenance funding through innovative programs;

- Advocate the need for a reauthorized federal surface transportation program;
- Encourage the use of life-cycle cost analysis principles to evaluate the total cost of projects;
- Encourage the use of cost-benefit analysis principles in evaluating projects;
- Continue to use PennDOT's *Smart Transportation* principles in road design
- Support environmental streamlining of transportation projects;
- Develop and implement creative financing and project delivery strategies for high priority projects (such as public-private partnerships and design/build); and,
- Advocate for additional research and development funding.

## SOURCES

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ASCE Policy Statements:

- ASCE Policy Statement 276: [Integrated Truck and Highway Design \(PS 276\)](#)
- ASCE Policy Statement 367: [Highway Safety \(PS 367\)](#)
- ASCE Policy Statement 382: [Transportation Funding \(382\)](#)
- ASCE Policy Statement 454: [Intelligent Transportation Systems \(PS 454\)](#)
- ASCE Policy Statement 496: [Innovative Financing for Transportation Projects \(PS 496\)](#)
- ASCE Policy Statement 497: [Surface Transportation Research Funding \(PS 497\)](#)

