

Catching Up: Greater Focus Needed to Achieve a More Competitive Infrastructure

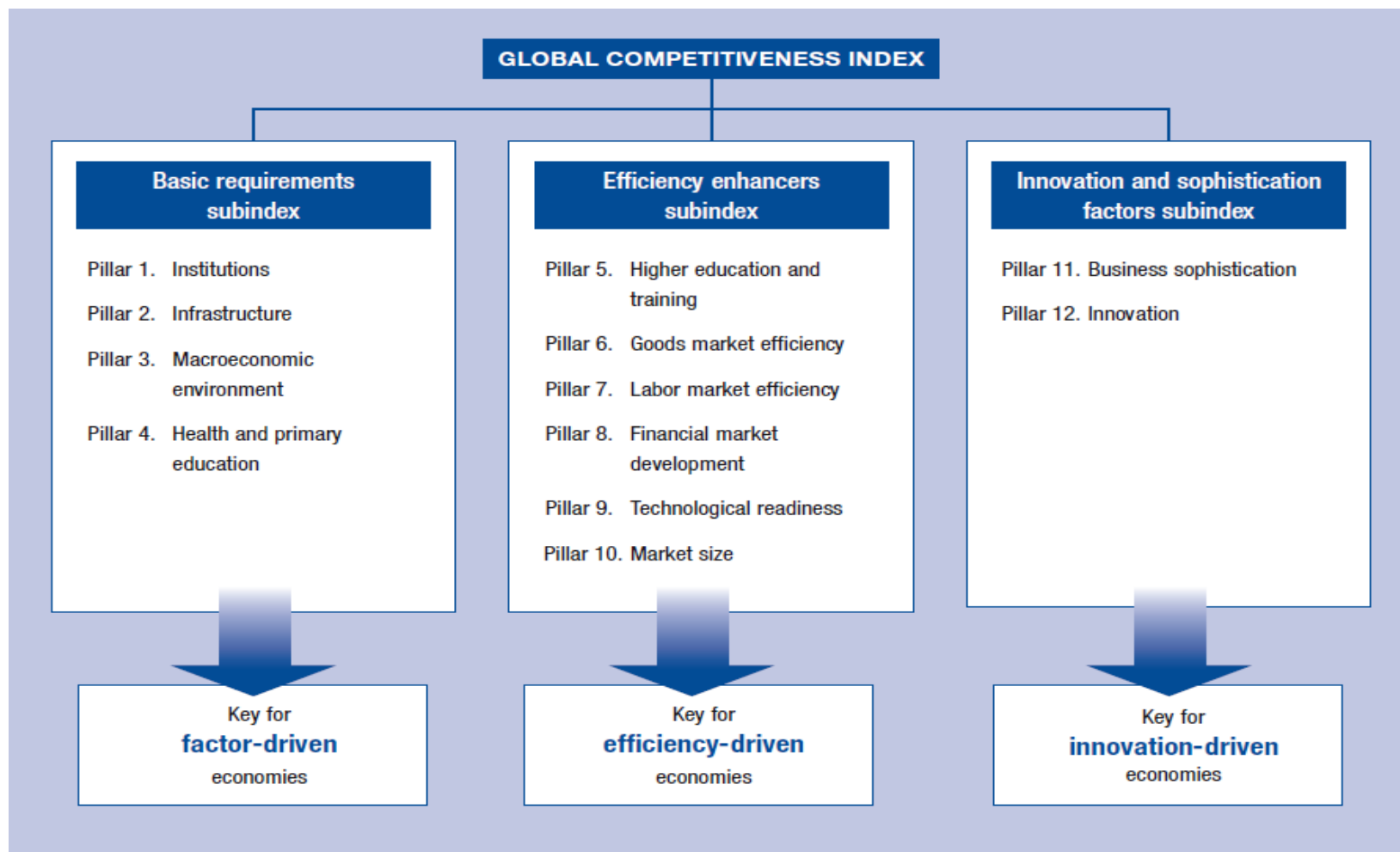
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Infrastructure and Competitiveness



ASCE Report Card (Engineering Assessment):

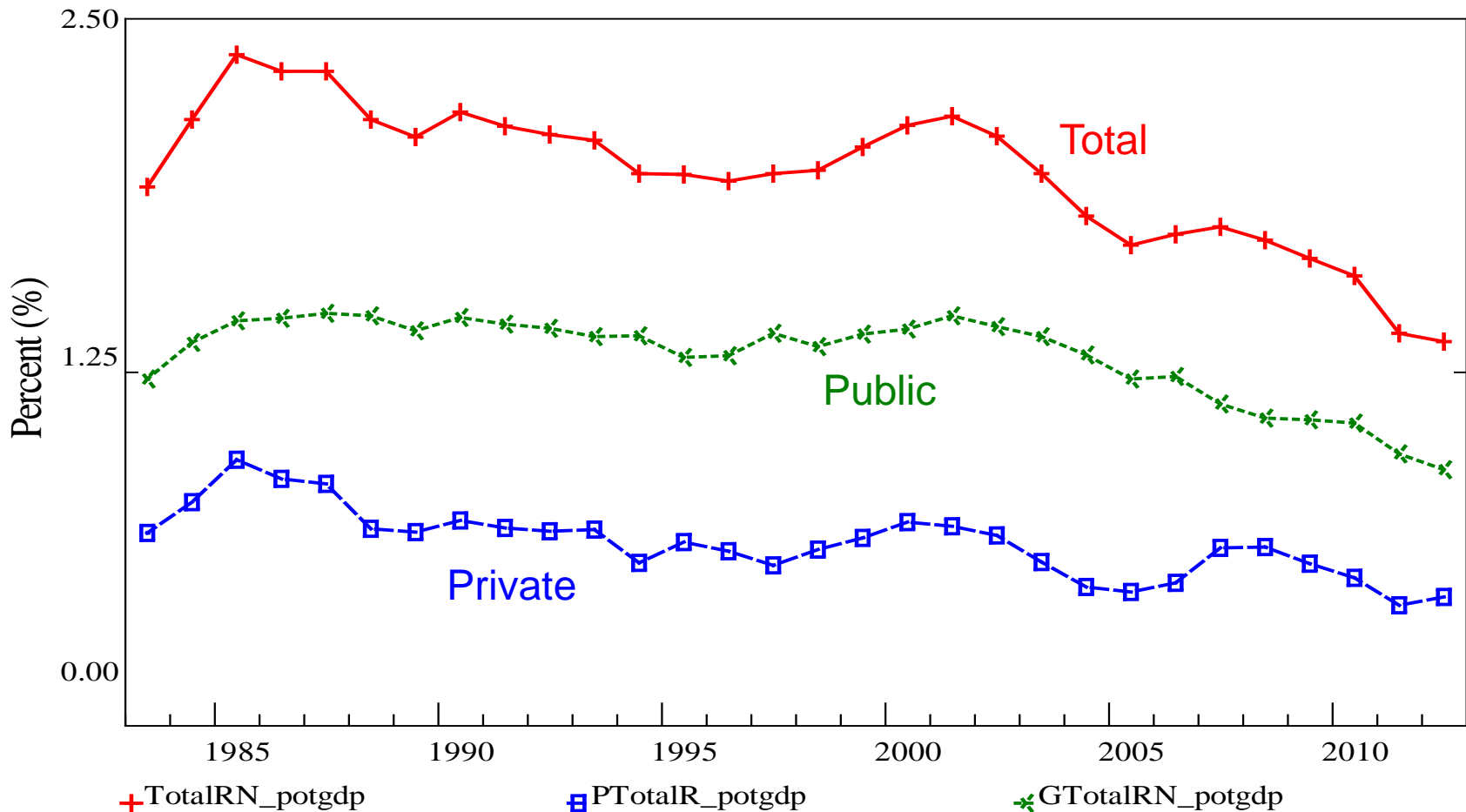
Have we badly neglected infrastructure spending?

<u>Infrastructure System</u>	<u>2009</u>	<u>2013</u>	<u>Infrastructure System</u>	<u>2009</u>	<u>2013</u>
Aviation	D	D	Ports	n/a	C
Bridges	C	C+	Parks & Recreation	C-	C-
Dams	D	D	Rail	C-	C+
Drinking Water	D-	D	Roads	D-	D
Energy	D+	D+	School	D	D
Hazardous Waste	D	D	Solid Waste	C+	B-
Inland Waterways	D-	D-	Transit	D	D
Levees	D-	D-	Wastewater	D-	D
			Overall	D	D+

Source: American Society of Civil Engineers (ASCE), *Report Card for America's Infrastructure*.

Total Real Infrastructure Investment: Decade-long decline

Total Infrastructure Real Investment Share of Potential GDP



There are several ways to define “infrastructure spending”

Capital Spending on Infrastructure in 2012, by Category
Billions of Dollars

Infrastructure	Public – Federal	Public – State & Local	Total Public	Total Private	Total
Highways and Streets	43.9	44.5	88.4	0.6	89.0
Mass Transit	9.1	9.5	18.7	0.0	18.7
Rail	1.0	0.0	1.0	9.5	10.4
Aviation	5.8	9.3	15.2	1.0	16.2
Ports and Inland Waterways	1.3	2.4	3.7	0.0	3.7
Pipelines	–	–	–	16.3	16.3
Total Transportation	61.2	65.8	126.9	27.5	154.5
Water Resources	6.4	0.0	6.4	–	6.4
Water Supply & Waste Disposal	4.4	33.2	37.6	2.2	39.7
Electrical Energy	0.9	9.5	10.4	62.8	73.2
Communications	–	–	–	17.3	17.3
Total Utilities and Other	11.7	42.7	54.4	82.3	136.7
Total Infrastructure Spending	72.9	108.5	181.3	109.8	291.2

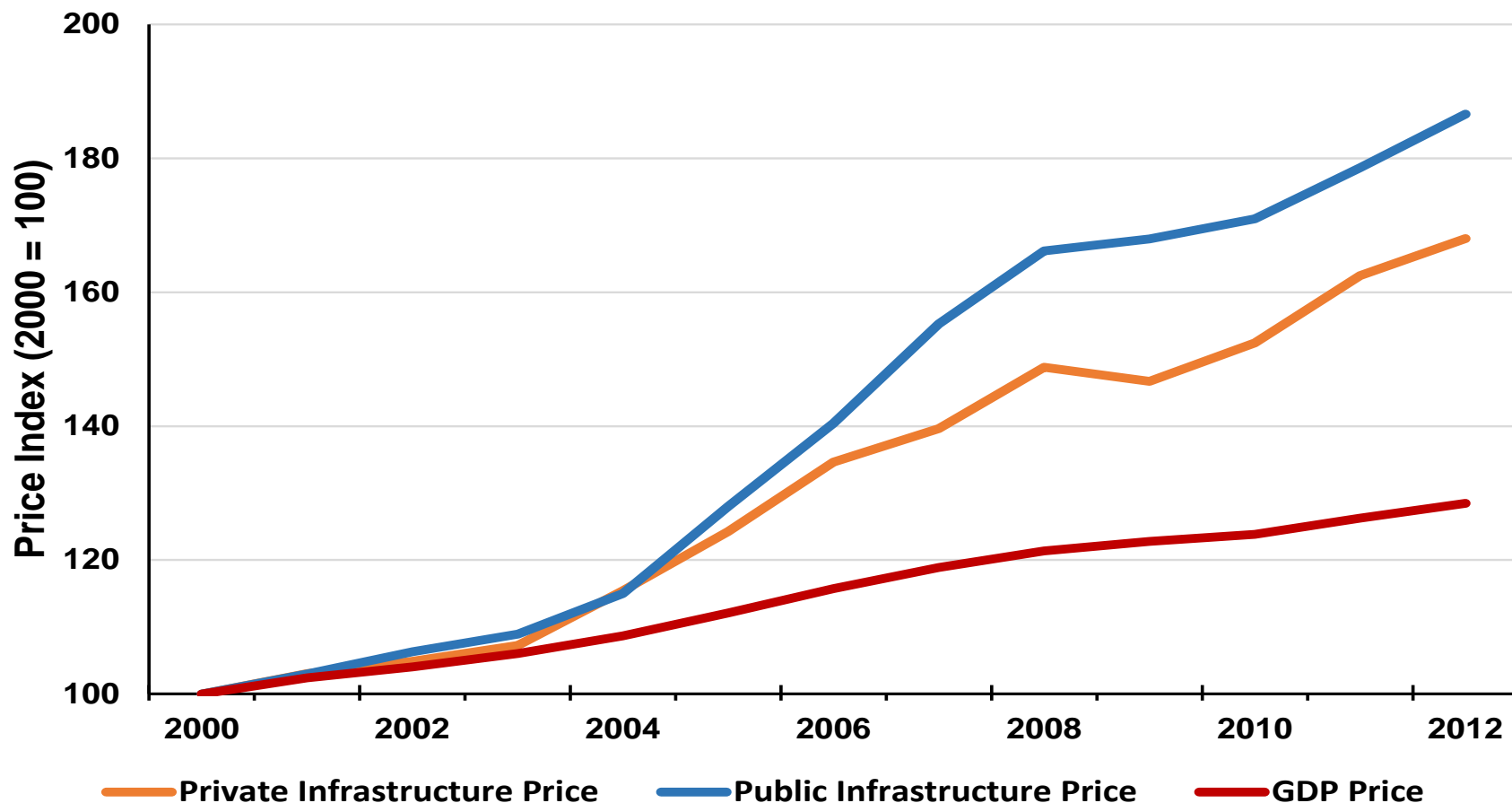
Public spending figures are measured in Fiscal Years ending September 30. Private spending figures are measured in calendar years.

Sources: U.S. Congressional Budget Office; U.S. Office of Management and Budget; U.S. Bureau of Economic Analysis, National Income and Product Accounts and Fixed Assets Database; and authors’ estimates

Public Infrastructure Data

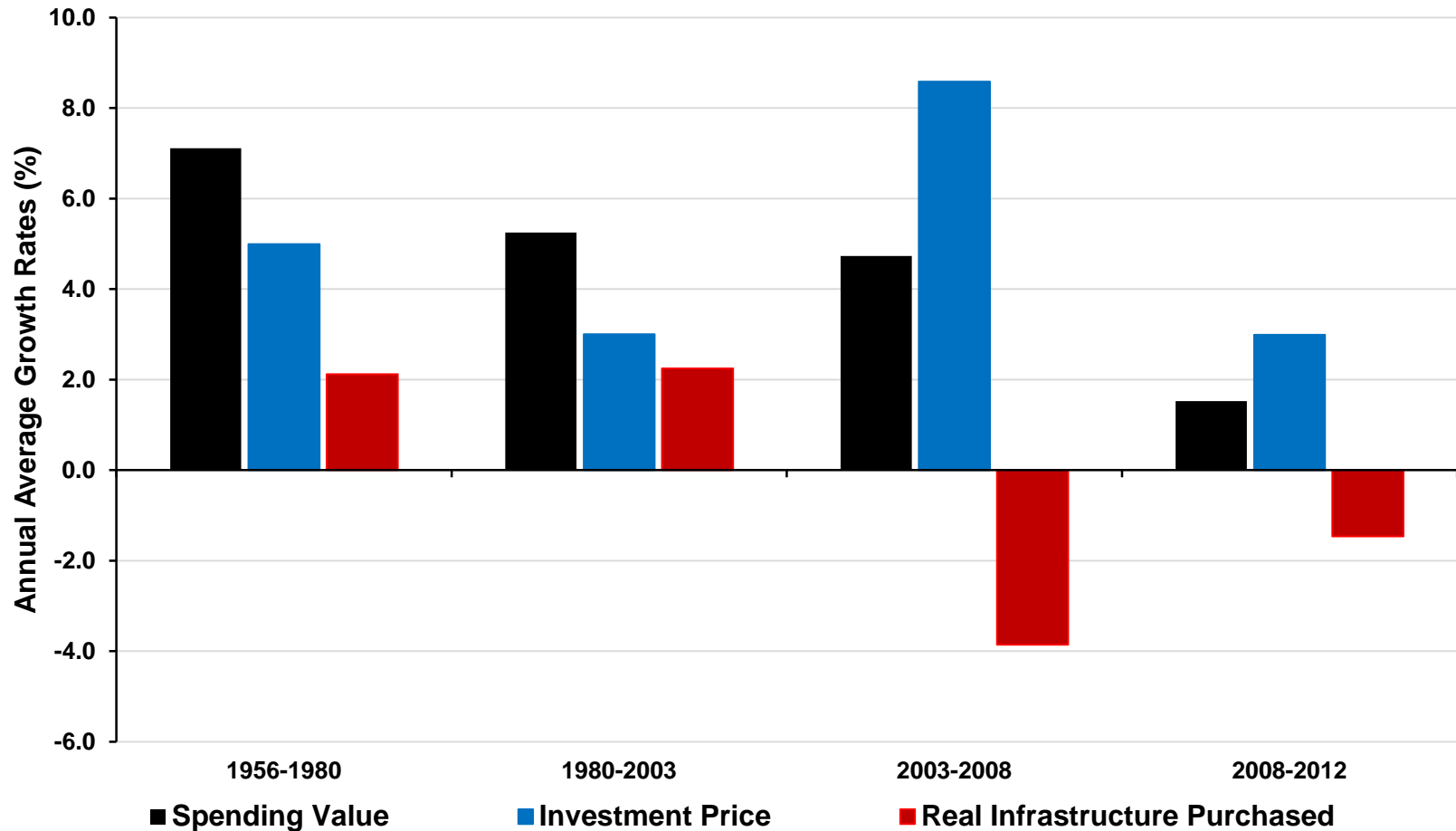
- CBO Studies: Expenditure by various type of infrastructure.
 - Detail in both real and nominal terms.
 - O&M expenditures as well as capital expenditures.
 - Structures, major equipment, plus real estate.
 - Data from 1956.
 - No comprehensive update since CBO 2010, with federal spending until 2009, state and local through 2007.
- We revise the CBO data set and extend it through 2012.
- We find interesting and perhaps alarming patterns in the data.

Infrastructure price growth is much higher than average



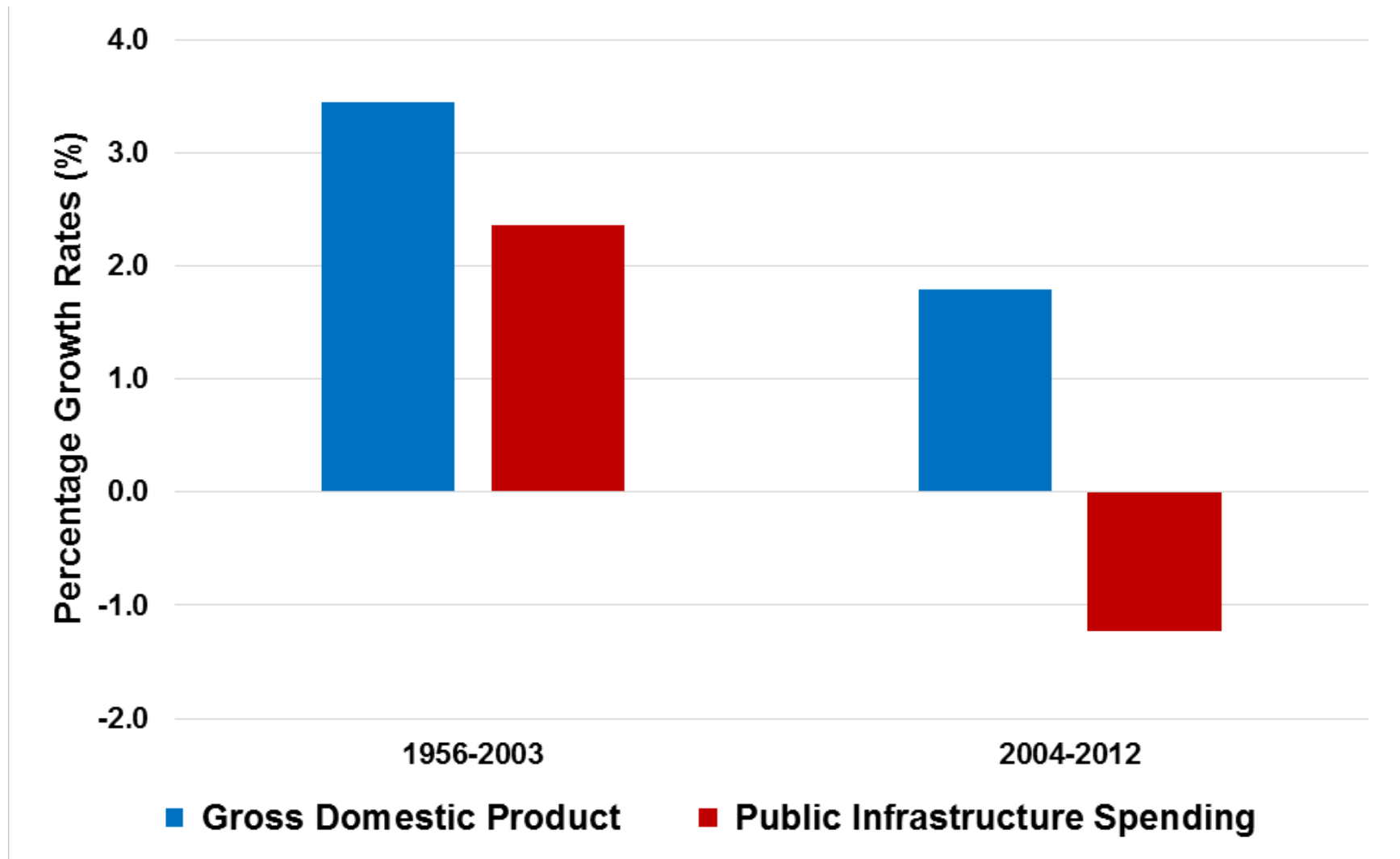
Sources: U.S. Congressional Budget Office; U.S. Office of Management and Budget; U.S. Bureau of Economic Analysis, National Income and Product Accounts and Fixed Assets Database; and authors' estimates

Real Public Infrastructure Investment: 5 Decades Growth, 1 Decade Decline

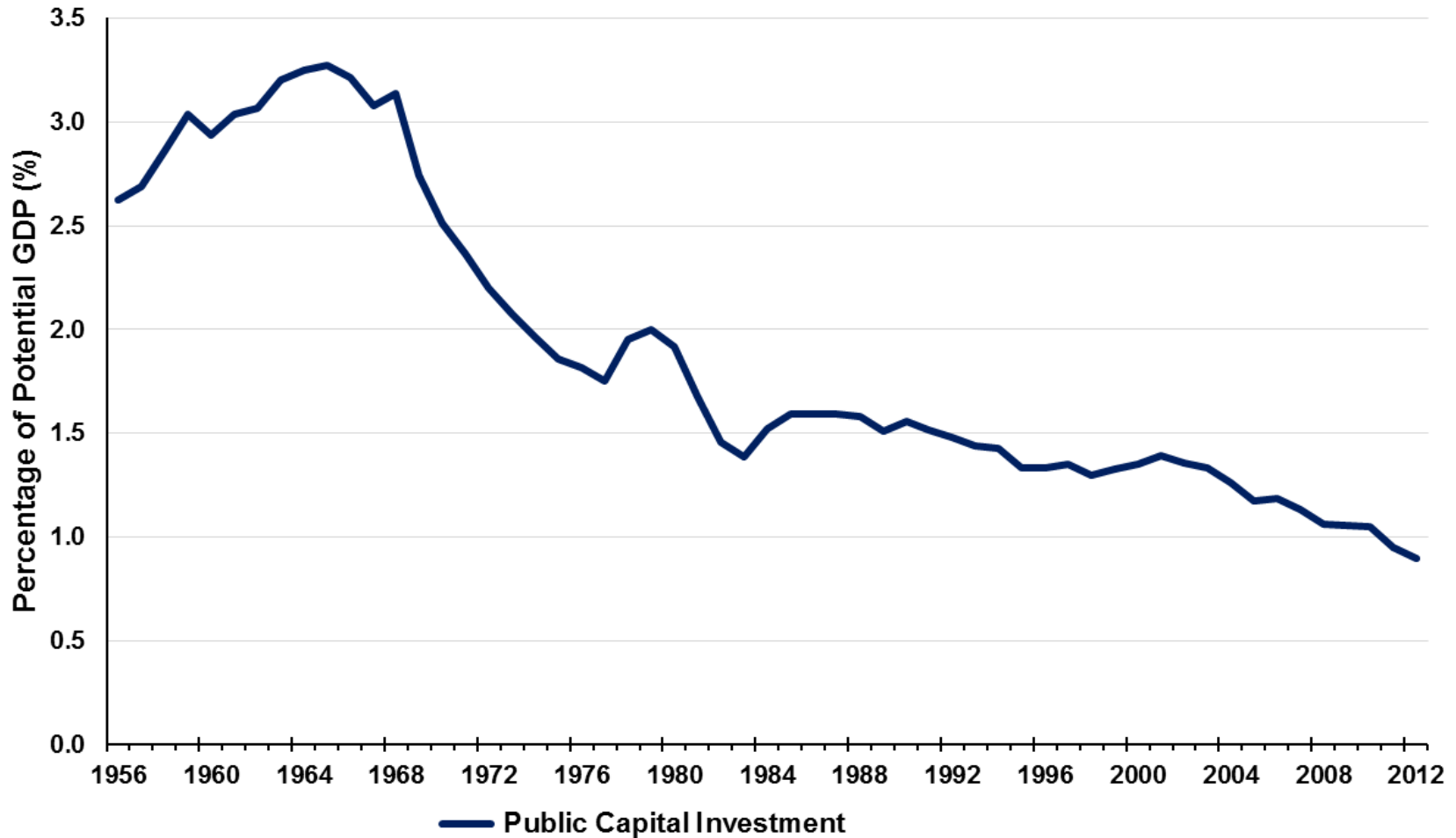


Sources: U.S. Congressional Budget Office; U.S. Office of Management and Budget; U.S. Bureau of Economic Analysis, National Income and Product Accounts and Fixed Assets Database; and authors' estimates

Real Public Infrastructure Investment: Recently Falling While GDP Rises



Real Public Infrastructure Investment: Falling Share of Potential GDP



Real Public Infrastructure Investment: 2003-2012

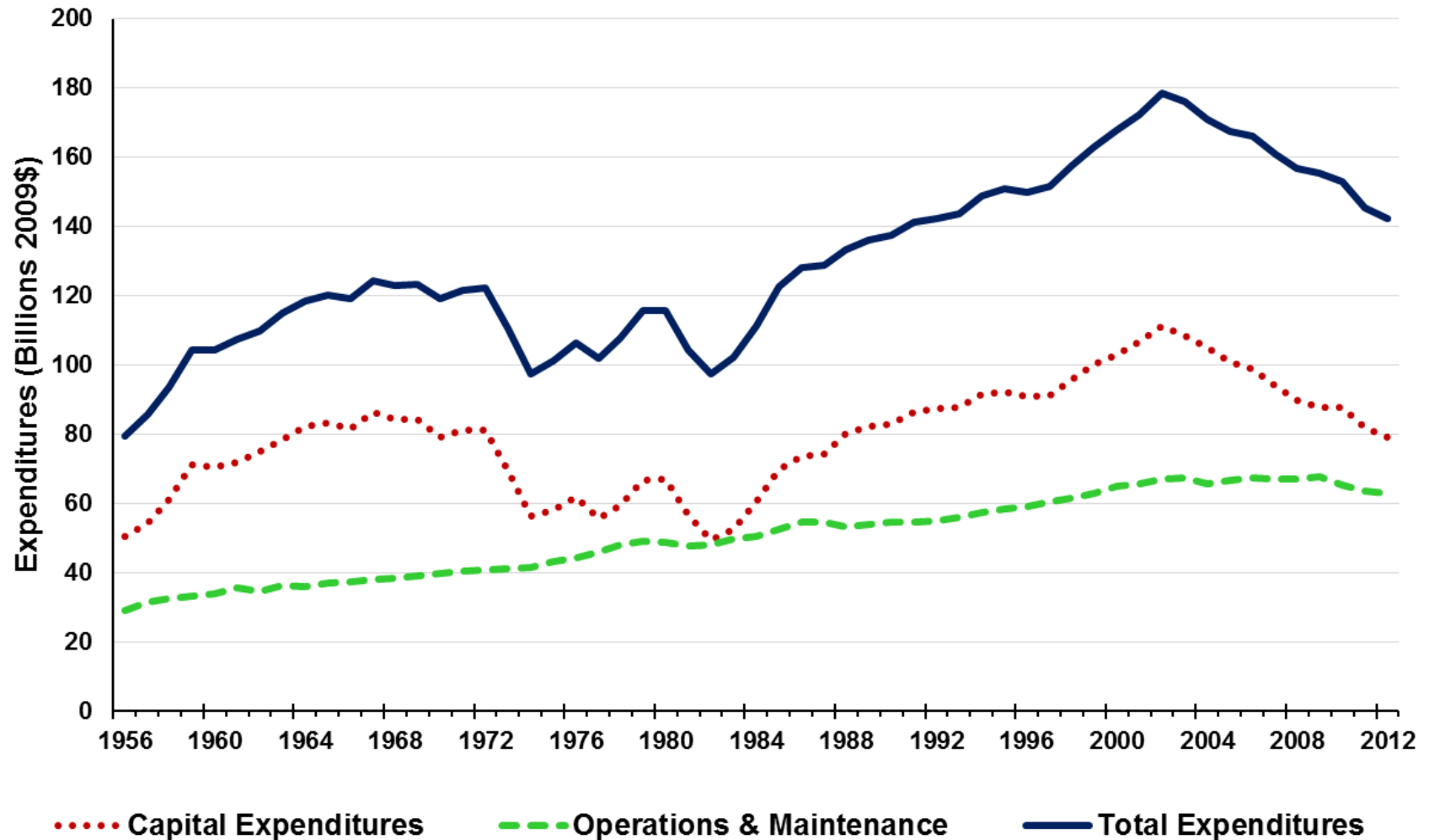
	Billions of 2012\$	Billions of 2012\$	Average Annual Percentage Growth	Cumulative Percentage Change
	2003	2012	2003-2012	2003-2012
Real Gross Domestic Product	13,724.40	16,244.60	1.7	18.4
Public Infrastructure Spending	423.87	379.19	-1.2	-10.5
Highways and Streets	193.22	155.98	-2.4	-19.3
Mass Transit	61.43	58.57	-0.5	-4.7
Rail	1.73	1.78	0.3	3.1
Aviation	42.57	36.89	-1.6	-13.4
Ports and Inland Waterways	11.73	9.58	-2.3	-18.3
Water Resources	11.08	11.42	0.3	3.1
Water Supply and Waste Disposal	102.37	104.97	0.3	2.5

Sources: U.S. Congressional Budget Office; U.S. Office of Management and Budget; U.S. Bureau of Economic Analysis, National Income and Product Accounts and Fixed Assets Database; and authors' estimates

Public infrastructure: Highways and streets are special

- About 40-50% of all public infrastructure spending. Budget outcomes and other legislative decisions have big impacts.
- Basic consumer transport. Ground transport accounts for 10% of the consumer budget. Work, life, play.
- All the other transport modes depend on roads. World class port, rail, or air services can be largely negated by poor roads.
- Real highway spending has fallen for a decade. Other sectors show similar patterns, but they are less marked.

Real Public Expenditures: Streets and Highways



Implications of high construction price growth on streets and highways

- The decline in overall real infrastructure spending for from 2003 to 2012 was a departure from a long-term pattern of growth since the 1950s.
- Construction prices rose rapidly from 2003-2008. Therefore the decline in real spending after 2003 was mainly due to increases in the cost of construction, but nominal spending grew as before.
- From 2008 to 2012, real spending fell because nominal spending was flat.
- Even a constant nominal spending-to-GDP share thus is not sufficient to maintain real investment levels.

Methodology: What happens with a larger investment?

Long term benefits of infrastructure investment:

- Persistent infrastructure gaps lead to further degradation of transport and utility infrastructure.
- Develop specific cost shocks to transport and utility sectors directly dependent on infrastructure.
- Specific **cost (or price)** shocks to sectors that provide own-transportation.
- Increased “real” **costs** to consumer sector

Short term benefits of investment (politically correct):

- Lost private and public capital investment will hinder economic growth, especially given current weakness.

LIFT Modeling Study: What happens with a larger infrastructure investment?

Long-term benefits (quantified):

- Highways and streets: higher labor productivity, less congestion, lower vehicle costs.
- Mass transit: lower operating costs, reduced delays.
- Ports and inland water transport: lower shipping costs directly enhance trade competitiveness.
- Air transport: higher labor productivity, less congestion, lower costs.
- Water and wastewater: lower costs of provision.

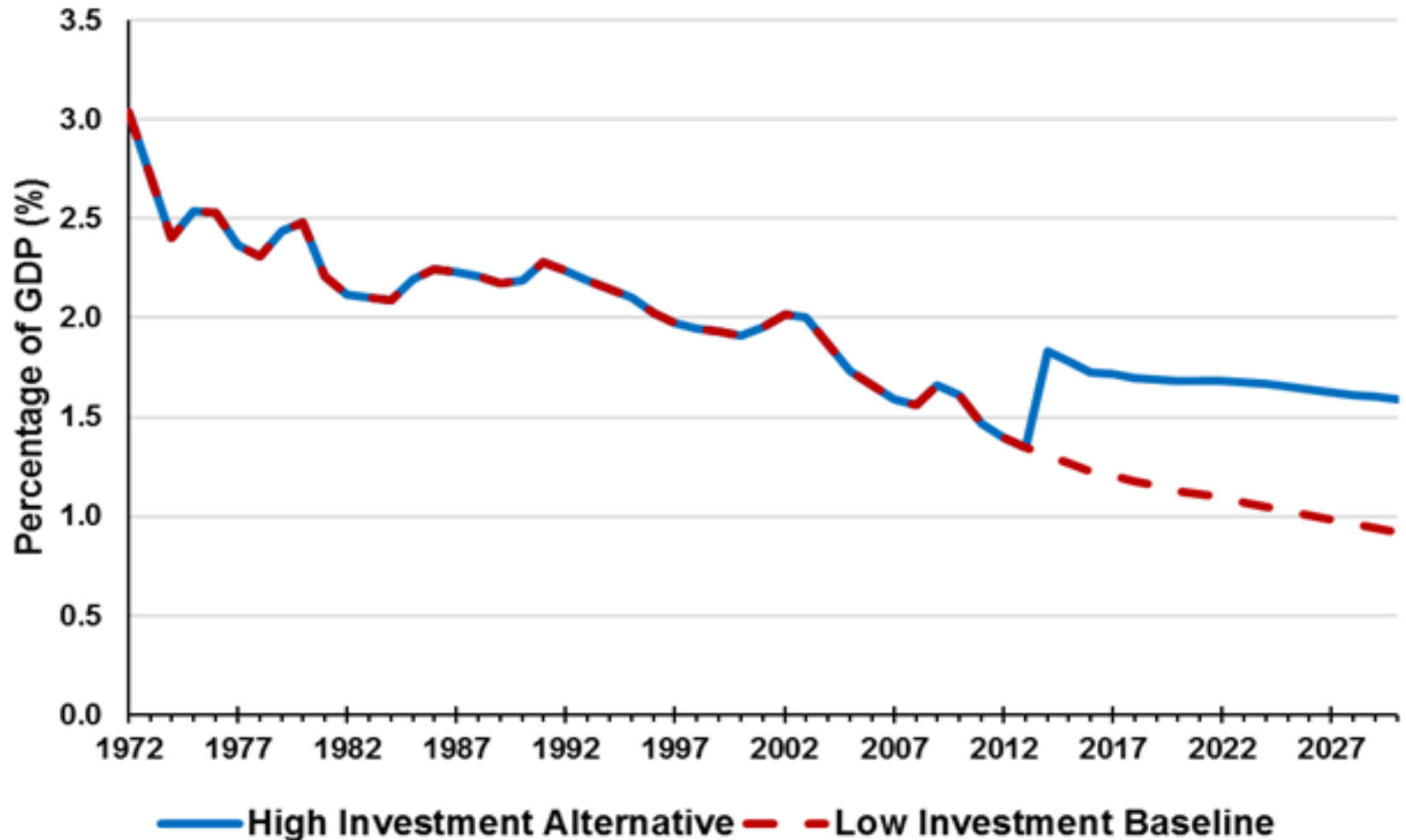
Short term benefits:

- Public capital investment boosts economic growth, especially given current weakness.

Enhanced investment is large

	Difference in Investment, Billions of 2009\$				
	2015	2017	2020	2025	2030
Highways and Streets	60.0	63.3	73.8	93.0	114.4
Mass Transit and Rail	8.0	8.3	9.2	10.9	12.7
Ports and Inland Waterways	2.0	2.0	2.1	2.2	2.4
Aviation Facilities	5.0	5.2	5.7	6.7	7.7
Water and Wastewater	8.0	8.4	9.7	11.9	14.2
Total Public Investment	\$83.0	\$87.3	\$100.6	\$124.7	\$151.4
As percent of GDP	0.5	0.5	0.5	0.6	0.6

Engineers recommend a much larger spend for infrastructure



Enhanced Infrastructure Impacts

	2015	2017	2020	2025	2030
Enhanced Real Investment					
Billions of 2009\$	83	87	101	125	151
As percent of GDP	0.5	0.5	0.5	0.6	0.6
REAL GDP by FINAL DEMAND CATEGORY					
Gross Domestic Product	0.9	1.0	1.3	2.3	2.9
Personal Consumption	0.4	0.6	1.0	2.0	2.7
Nonresidential Structures	1.6	1.3	0.9	2.2	2.4
Equipment Investment	1.4	0.9	0.7	1.6	1.7
Residential Investment	0.9	1.3	0.7	2.7	3.0
Exports	0.2	0.5	1.0	2.0	2.8
Imports	1.3	1.2	1.6	2.8	3.4
Government	2.7	2.8	3.4	4.3	4.9
PRICE INDICATORS					
GDP Deflator	0.1	0.3	0.2	-0.3	-0.4
PCE Deflator	0.0	0.1	0.0	-0.8	-1.0
Exports Deflator	0.0	0.0	-0.2	-0.7	-1.0

Enhanced Infrastructure Impacts

LABOR FORCE, EMPLOYMENT, PRODUCTIVITY

Labor Force	0.1	0.3	0.5	0.5	0.5
Thousands	160	447	835	868	912
Total Employment	0.8	1.1	0.8	1.0	0.6
Thousands	1283	1721	1298	1580	1130
Total Lab Productivity (12\$/hr)	-0.1	-0.2	0.4	1.2	2.2

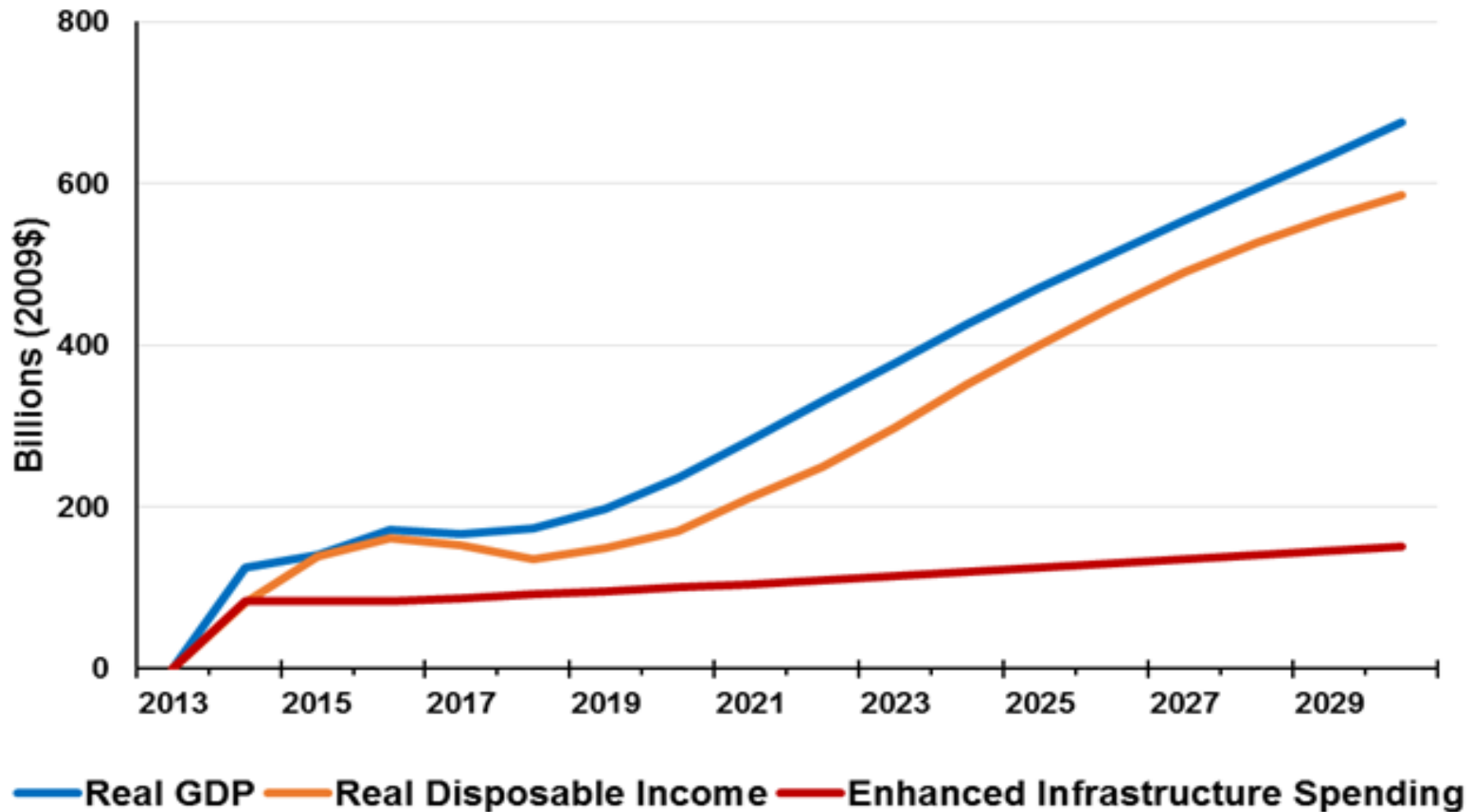
REAL DISPOSABLE PERSONAL INCOME

Percent Difference	1.2	1.2	1.2	2.6	3.4
Billions of 2009\$	140	153	170	401	587
2009\$ per Household	1122	1201	1300	2916	4072

NOMINAL FISCAL BALANCES (Billions of dollars)

Public Infrastructure Spending	98.6	109.1	136.2	189.1	253.0
as percent of GDP	0.5	0.5	0.6	0.6	0.6
Government Net Borrowing	94.4	76.4	1.4	-25.5	-55.7
as percent of GDP	0.5	0.3	-0.1	-0.1	-0.2
Government Net Debt	161	321	404	255	125
as percent of GDP	0.1	0.5	0.4	-0.8	-1.6

Benefit/Cost Ratio Increases over time



Industry Output

Figures show the percent difference between high and low investment scenarios.

	2015	2017	2020	2025	2030
Gross Domestic Product	0.9	1.0	1.3	2.3	2.9
Agriculture,forestry,fisheries	0.4	0.7	1.1	1.9	2.5
Mining	1.0	1.0	1.2	1.8	2.2
Construction	4.3	4.4	4.4	6.5	7.4
Manufacturing					
Non-Durables	0.7	0.8	1.2	2.2	2.8
Durable materials & products	1.7	1.6	1.9	3.1	3.6
Non-Electrical Machinery	1.3	1.1	1.2	2.3	2.7
Electrical Machinery	0.6	0.6	0.9	2.0	2.9
Transportation Equipment	0.8	0.7	1.1	2.1	2.6
Instruments & miscellaneous	0.5	0.5	0.8	1.6	2.1
Transportation	1.0	1.2	1.7	3.1	4.1
Utilities	0.3	0.4	0.7	1.4	1.7
Trade	0.6	0.8	1.2	2.5	3.2
Finance, Insur & Real Estate	0.5	0.6	1.0	2.2	2.9
Services	0.9	0.9	1.2	2.2	2.8

Industry Employment

Difference between high and low investment scenarios in thousands of jobs.

	2015	2017	2020	2025	2030
Agriculture,forestry,fisheries	-2	1	-23	-55	-96
Mining	9	10	7	5	1
Construction	672	741	693	918	985
Manufacturing	113	155	103	124	75
Non-Durables	28	49	38	52	45
Durable materials & products	48	53	37	42	24
Non-Electrical Machinery	22	28	15	16	4
Electrical Machinery	5	7	4	3	0
Transportation Equipment	8	13	8	12	6
Instruments & miscellaneous	2	4	0	-1	-5
Transportation	1	-14	-80	-178	-315
Utilities	2	10	4	0	-11
Trade	104	223	170	262	172
Finance, Insur & Real Estate	24	56	40	51	31
Services	360	537	382	449	282
Total Employment	1283	1721	1298	1580	1130

Compelling case for more investment now.

A horizontal bar with a black segment on the left and a red segment on the right, spanning the width of the slide.

1. New funding will help catch up from a well-documented backlog of deferred infrastructure projects that have accumulated over the past 10 years, including maintenance, repair, and new capacity.
2. A new national strategy can embrace innovations in finance and regulatory reform and construction and operational efficiencies. Provides a catalyst for businesses to invest in new expansion and growth.
3. Greater infrastructure investment will improve an economy that continues to suffer from high unemployment, lackluster growth. Interest rates currently are very low.