

#### MOVING BEYOND RECESSION: Transportation & Development Infrastructure

Steven Landau

Economic Development Research Group, Inc. www.edrgroup.com

Rocky Mountain Land Use Institute Annual Conference, March 14, 2014

Aviation	D
Bridges	C+ 🚹
Dams	D
Drinking Water	D 🕆
Energy	D+
Hazardous Waste	D
Inland Waterways	D-
Levees	D-
Ports	С
Public Parks and Recreation	C-
Rail	C+ 🚹
Roads	D 🚹
Schools	D
Solid Waste	B- 🚹
Transit	D
Wastewater	D 🔒
America's Cumulative G.P.A.	D+ 🔒

#### 2013 REPORT CARD FOR America's infrastructure

- A = Exceptional
- **B** = Good
- **C** = Mediocre
- D = Poor
- **F** Failing

Each category was evaluated on the basis of capacity, condition, funding, future need, operation and maintenance, public safety, resilience, and innovation



# U.S. is not Alone

For Example: A McKinsey & Co. study in 2013 estimated that Germany needs to invest \$69 billion in its roads to meet expected demand in the coming years.

- Germany placed 10th in the world in 2013 in terms of quality of overall infrastructure, according to <u>surveys by</u> the World Economic Forum, down from third place in 2006.
- The United States was ranked 19th in 2013, down from eighth in 2006.



#### **Percent of GDP for Public Investment**



Note: Users of the data must be aware that they may no longer fully reflect the current situation in fast-reforming countries.

- 1. Average 2006-10 for Chile, Japan, Korea, Mexico and average 2006-09 for New Zealand and the Russian Federation.
- 2. Average 2002-06 for the Russian Federation.
- 3. The OECD average excludes Turkey.

Source: OECD (2012), OECD Economic Outlook, Vol. 2012/2.



#### Government Investment has been Declining since 1970



Source: New York Times, 10/18/13



# A Sharp Drop in Government Infrastructure Spending





#### Is Infrastructure Underfunded? If so, does the Underfunding Impede Economic Performance?





#### Why Should We Care?

Savings and/or Costs	Surface Transportation	Water Wastewater Electricity	Airports	Marine Ports Inland Waterways
Direct to Business	Costs for services; costs of inputs			
Direct to Households	Costs for Services			
Indirect to Business	Labor access		Specialized Labor	
	Profitability			
Indirect to Households	Cos	st of purchases	s: disposable	income



# **Overarching Assumptions**

- Trends extended for needs to 2040
- Did not assume major interruptions infrastructure failure such as bridge collapse or weather catastrophe
- Did not consider construction impacts for building/modernizing needed infrastructure
- Infrastructure performance does not have to be perfect
  - B Level, Not A-Level
  - Minimum Tolerable Conditions



#### Surface Transportation "Needs Models"

Model	Data Set
HERS-ST	Highway Performance Monitoring System
TERM	National Transit Database
NBIAS	National Bridge Inventory
CUBE/Voyager	Freight Analysis Framework (FAF3)
TREDIS	BEA and other data sets from the US Department of
LIFT	Commerce and Bureau of the Census

#### Different Aspects of the Cost Equation

- Cost of Operating on Deficient Pavement
- Cost of Operating in Congested Conditions
- Cost of time lost due to delay
- VMT and VHT of re-assigning due to congestion
- Cost of Bridge Detours
- Cost of Transit Interruptions



# **Findings of Needs Models**

#### Highway and Bridge Needs

- \$220 Billion average annual highway & bridge investment need (2010-2040)
- \$25 Billion average annual transit investment need (2010-2040)

#### Urban Interstate Congestion Drives Costs

- Urban interstate speeds average 10 MPH less than they would in a fully funded system
- This speed decrease is 13 MPH by 2040



#### **Urban Re-Assignment Effects**

- 18% of Urban Interstate VMT is re-assigned to alternative routes or to arterials due to congestion
  - ✤ By 2040 this will create \$34 Billion additional VHT
- Urban Interstate Congestion Transfers demand and cost to other areas:
  - Users in other states
  - Users in non-urban areas



#### **Urban Re-Assignment Effects**





#### Economic Consequences By 2020 and 2040

#### **Annual Impacts**

	2020	2040
Business Sales	(\$324)	(\$301)
GDP	(\$240)	(\$232)
Jobs	(877,000)	(410,000)
Disposable Personal Income	(\$230)	(\$227)

Dollars in Billions, \$2010 Value



#### U.S. Navigation System Marine & Inland Ports



15

Economic Development

# Hours of Scheduled & Unscheduled Delay on US Inland Waterways, 2009

FACTOR	CY2009
Number of Scheduled Delays	6,532
Hours Delayed Due to Scheduled Delays	81,882
Number of Unscheduled Delays	12,494
Hours Delayed Due to Unscheduled Delays	73,689
TOTAL Number of Delays	19,026
TOTAL Hours of Delay	155,571



# **Cost By Commodity**

COMMODITY	2020	2040
Coal, Lignite and Coal Coke	- \$1,153	- \$1,555
Petroleum and Petroleum Products	- \$3,609	- \$4,300
Chemicals and Related Products	- \$985	– \$1 <i>,</i> 865
Crude Materials, Inedible Except Fuels	- \$1,062	- \$1,944
Primary Manufactured Goods	- \$389	- \$837
Food and Farm Products	- \$1,925	– \$3 <i>,</i> 062
All Manufactured Equipment, Machinery	- \$141	- \$277
Total Unknown or Not Elsewhere Classified	- \$22	<b>-</b> \$45
ΤΟΤΑΙ	- \$ <b>9,286</b>	- \$ <b>13,885</b>

Millions of \$2010s



#### 3,330 NPIAS Airports in the U.S

Airport Class	NPIAS Airports (U.S.)
Large Hub	29
Medium Hub	36
Small Hub	74
Commercial, Non Hub,Non-Primary	360
Reliever	268
GA	2,563
Total	3,330



# **Funding Gaps**

Airports	Marine Ports/Inland Waterways
Data from FAA and ACI-NA Extending the trends shows roughly \$13 B in need and \$11 B in expenditures per years through 2020 and \$12 B in need to \$11 billion in expenditures1from 2021 to 2040	Data from US Army Corps of Engineers Future spending needs that have been traditionally public sector are estimated to total approximately \$30 B by 2020 and \$92 B by 2040.
Also, congestion relief is being proposed through the Next Generation Air Transportation System (NextGen), estimated at \$31 B in addition to the \$9 B already invested	Funding gaps of \$16 B by 2020 and \$46 Billion by 2040 are expected to result from the difference between these estimated requirements and the annual budgets for navigational purposes historically been appropriated Congress



# Cost of Gap in Aviation Capital Expenditures

SECTOR	2007	2010	2012	2020	2040
Airlines	- \$8.69	- \$7.67	- \$8.37	- \$11.86	- \$22.08
Passengers	- \$8.39	- \$7.41	- \$8.08	- \$11.45	- \$21.32
Industries other than Airlines (Cargo)	- \$7.75	- \$6.84	- \$7.46	- \$10.57	- \$19.68
TOTALS	- \$ <b>24.83</b>	- \$ <b>21.91</b>	- \$ <b>23.90</b>	- \$ <b>33.87</b>	- \$ <b>63.08</b>

Billions of \$2010s



#### Economic Impacts of Marine Port & Inland Waterway Investment Gap

#### **National Impacts**

Annual Impacts	In 2020	In 2040
Jobs	- 738,000	- 1,384,000
GDP	-\$94	-\$256
Business Sales	-\$183	-\$517
Disposable Income	-\$117	-\$269

Cumulative Losses	2012-2020	2021-2040
GDP	-\$697	-\$3,278
Business Sales	-\$1,335	-\$6 <i>,</i> 496
Disposable Income	-\$872	-\$3,662

Billions of \$2010s



#### **Each Sector Faces a Shortfall**





#### Finally...

# What if Everything Fails?

#### **Based on Trends of the Recent Past:**

Cumulative infrastructure investment needs:

•\$2.7 trillion by 2020 and

•\$10 trillion by 2040.

Funding will 60% (approx. \$1.7 trillion) of these needs through 2020, and 53% by 2040.

Thus, the investment gaps will total

- •\$1.1 trillion by 2020, and
- •\$4.7 trillion by 2040.



#### **All is Not Hopeless**





#### Ranking of U.S. Infrastructure in Top 20

Indicator	Rank of 148
Quality of overall infrastructure	19
Quality of roads	18
Quality of railroad infrastructure	17
Quality of port infrastructure	16
Quality of air transport infrastructure	18
Available airline seats kms/week	1
Quality of electricity supply	30



# Overall Rankings According to World Economic Forum

Rank of 148		Rank of 148		<u>Other</u>	
1	Switzerland	11	Portugal	Rep. of Korea	23
2	Hong Kong SAR	12	Spain	United Kingdom	28
3	Finland	13	Luxembourg	Italy	53
4	United Arab Emirates	14	Japan	Mexico	66
5	Singapore	15	Canada	China	74
6	France	16	Belgium	Russian Federation	<mark>ו 93</mark>
7	Iceland	17	Oman		
8	Austria	18	Denmark		
9	Netherlands	19	<b>United States</b>		
10	Germany				



# **Quality of Roadways**

Rank of 148		Rank of 148		Other		
1	United Arab Emirates	10	Netherlands		Canada	19
2	France	11	Germany		United Kingdom	28
3	Oman	12	Japan		Ireland Mexico	29 51
4	Portugal	13	Spain		China	54
5	Hong Kong SAR	14	Taiwan		Italy	55
6	Austria	15	Republic of Korea		Russian Federation	136
7	Singapore	16	Luxembourg			
8	Switzerland	17	Saudi Arabia			
9	Finland	18	United States			



#### **Quality of Railroads**

Ra	ink of 148	Rai	nk of 148
1.	Japan	10	Singapore
2	Switzerland	11	Netherlands
3	Hong Kong SAR	12	Austria
4	France	13	Luxemburg
5	Spain	14	United Kingdom
6	Finland	15	Belgium
7	Germany	16	Canada
8	Republic of Korea	17	United States
9	Taiwan, China		

<u>Other</u>	
China	20
Italy	29
<b>Russian Federation</b>	31
Ireland	34
Mexico	60



#### Maybe Everything Will Be Fine...





#### **Thank You**

**Steven Landau** 

#### Economic Development Research Group, Inc. slandau@edrgroup.com www.edrgroup.com

