

The Metropolitan

*Water Reclamation District*

of Greater Chicago

**WELCOME  
TO THE NOVEMBER EDITION  
OF THE 2014  
M&R SEMINAR SERIES**

# BEFORE WE BEGIN

- PLEASE SILENCE CELL PHONES & SMART PHONES
- QUESTION AND ANSWER SESSION WILL FOLLOW PRESENTATION
- PLEASE FILL EVALUATION FORM
- SEMINAR SLIDES WILL BE POSTED ON MWRD WEBSITE  
([www.MWRD.org](http://www.MWRD.org): Home Page ⇒ Reports ⇒ M&R Data and Reports ⇒ M&R Seminar Series ⇒ 2014 Seminar Series)
- STREAM VIDEO WILL BE AVAILABLE ON MWRD WEBSITE  
([www.MWRD.org](http://www.MWRD.org): Home Page ⇒ MWRDGC RSS Feeds)

# Patrick Lach, P.E., CFM

***Current:*** Past-President of the Illinois Section of the American Society of Civil Engineers

***Education:*** B.S. in Civil Engineering from the University of Notre Dame, Indiana

***Experience:*** Over 13 years of water resources and civil engineering experience and management

- developing design plans and specifications
- performing cost estimates
- construction observation for civil engineering and water resources projects

**Area of expertise:**

- Hydrologic and hydraulic modeling
- Stormwater infrastructure design
- water resources design

a Senior Civil Engineer for Hey and Associates

***Professional*** Licensed professional engineer in Illinois, Indiana, Wisconsin, and Michigan.  
Certified floodplain manager (CFM)

# 2014 REPORT CARD FOR ILLINOIS' INFRASTRUCTURE

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Past-President  
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Illinois Section  
Founded 1916

# Introduction

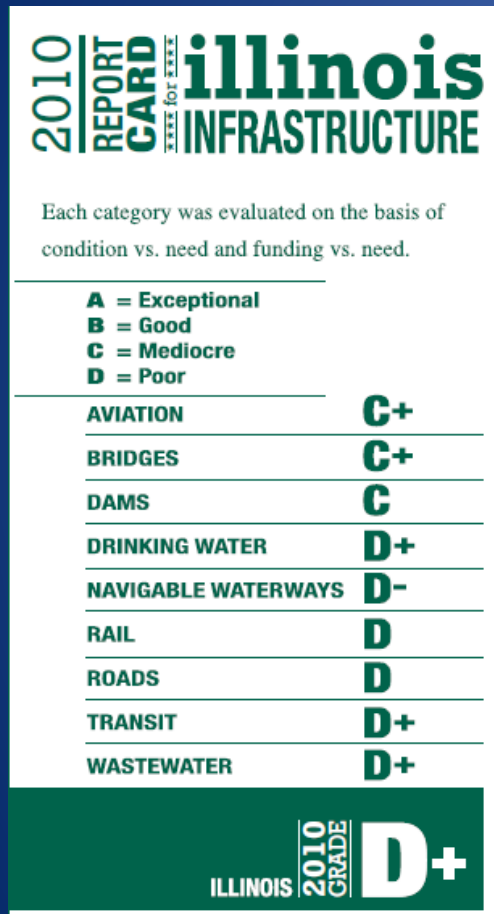
- Our Obligation:
  - Assess the state of the infrastructure
  - Report on its condition and performance
  - Advise on steps to improve it
- National Report Card Update released in 2013 (D+)

# Did We Make the Grade?

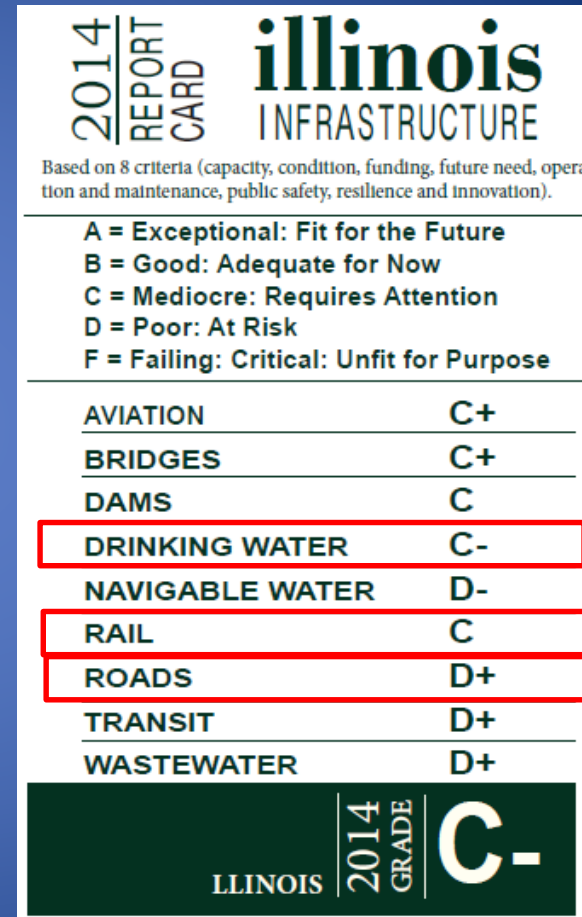
- Grading Criteria:
  - Capacity
  - Condition
  - Funding
  - Future Need
  - Operation and Maintenance
  - Public Safety
  - Resilience
  - Innovation
- Graders
  - 30 Professional Engineers (including staff from MWRDGC)
  - Public and Private Sector

2014 REPORT CARD		illinois INFRASTRUCTURE
Based on 8 criteria (capacity, condition, funding, future need, operation and maintenance, public safety, resilience and innovation).		
A = Exceptional: Fit for the Future B = Good: Adequate for Now C = Mediocre: Requires Attention D = Poor: At Risk F = Failing: Critical: Unfit for Purpose		
AVIATION		C+
BRIDGES		C+
DAMS		C
DRINKING WATER		C-
NAVIGABLE WATER		D-
RAIL		C
ROADS		D+
TRANSIT		D+
WASTEWATER		D+
ILLINOIS		2014 GRADE C-

# Are We at Least Making Progress?



2010



2014

# The Illinois Infrastructure Story



- Infrastructure is critical for:
  - Health and safety of our families
  - Vibrant communities
  - Economic growth and employment
  - Competitive advantage
- The Good News:
  - In areas where we invested – the grades improved!
- The Rest of the Story:
  - Without investment, grades remained low
  - Need long term sustainable funding source
  - Need to build modern and resilient systems



# Aviation

C+



- **11 Commercial Airports in Illinois**
- **O'Hare and Midway**
  - Annual Growth = 2.3%
- **Looking forward to 2040 Aircraft Operations:**
  - O'Hare #1
  - Midway #23...up from #28



# Aviation

- **Jobs: 350,000 – 500,000**
- **Economic Activity: \$40 billion**
- **Payroll: \$13 billion**
- **Federal Funding**
  - \$7 billion in FY 2000 to less than \$1 billion at the end of FY 2010
- **State Funding**
  - From \$380 million during *Illinois Jobs Now!* to \$159 million in 2014
- **O'Hare Modernization Program**



# Bridges

C+



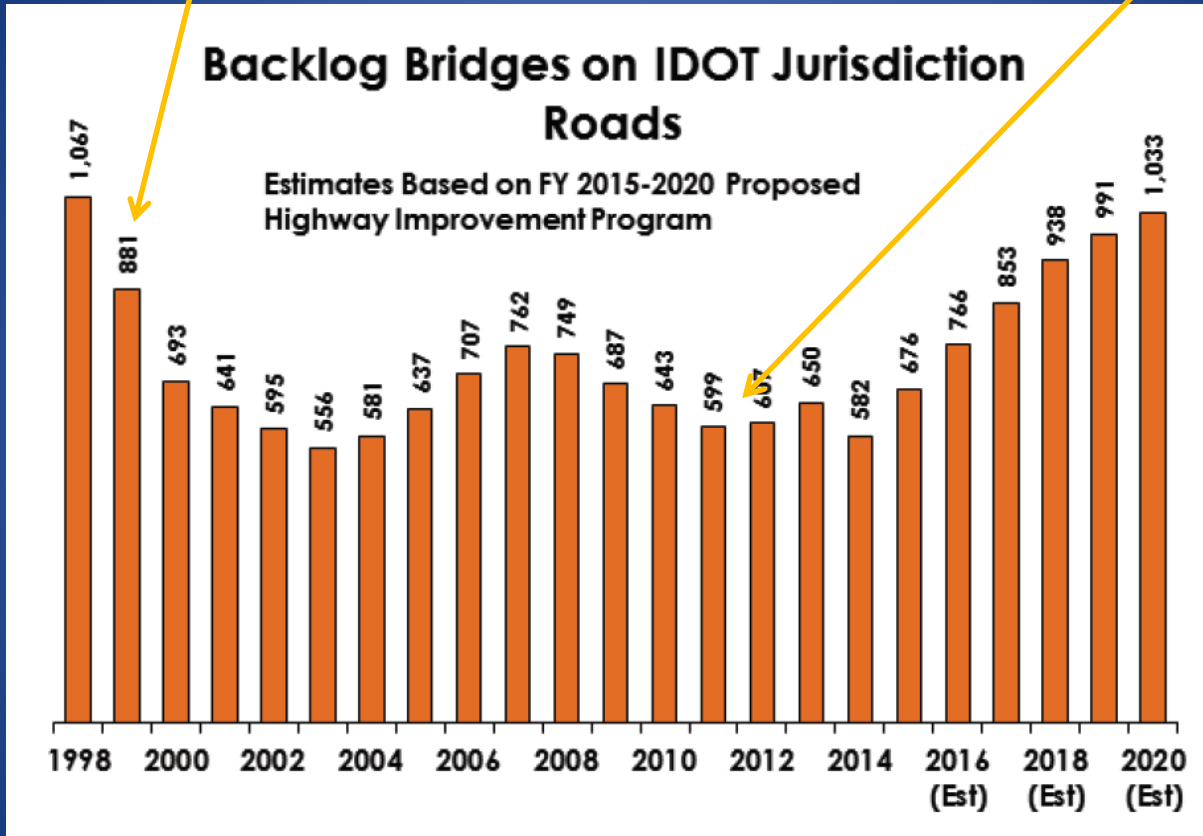
- Illinois Bridges = 26,514 (3<sup>rd</sup> most in nation)
- Structurally Deficient = 8.7%
- Functionally Obsolete = 7.5%
- National Condition Ranking = 6<sup>th</sup> lowest



# Bridges

Illinois First Plan

Illinois Jobs Now!



- Decreasing Funding Leads to Larger Backlog!



# Dams

C



- Total Dams = 1,759
  - High Hazard = 223
  - Significant Hazard = 298
  - Low Hazard = 1,238
- Of the 223 Class I dams in Illinois, 177 (79%) are permitted.
- Of the 298 Class II dams in Illinois, only 138 (46%) are permitted.



# Dams

- State Regulated Dams per Full Time Employee (FTE)
  - National Average = 200
  - Illinois = 350
- High Hazard Dams per FTE
  - National Average = 27
  - Illinois = 46
- Dam Safety Program is strong
- Funding needed for more FTE and Dam Rehabilitation



# Drinking Water



**Population Served by CWS by Source Type  
(11,944,770 total persons served)**

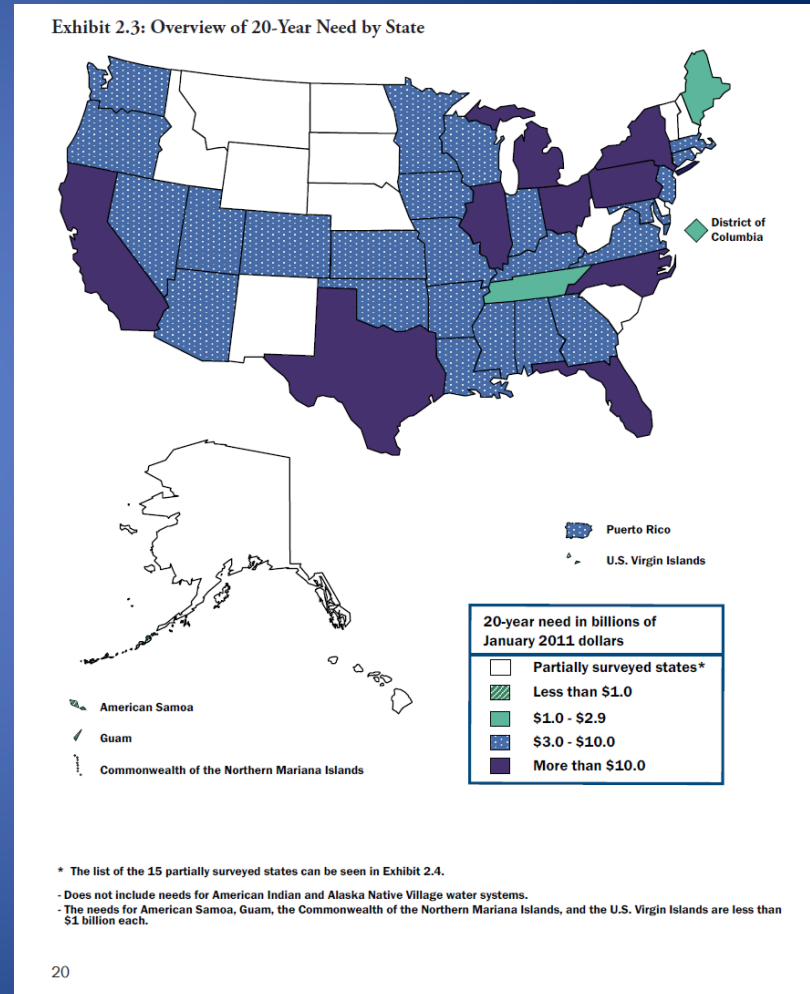


In 1900, the average residential use of potable water in the U.S. was five gallons per day per person. Today, that number has increased to 100 gallons per day per person.



# Drinking Water

- Illinois 20-Year Investment Needed = \$19 billion
- City of Chicago
  - 4,400 miles of watermain
  - One quarter > 100 years old
  - 1 billion gallons/day
  - Losses of 70 million gals/day
  - 10-Year Plan to replace oldest 900 miles of pipe
- Illinois Programs
  - Public Water Supply Program - \$58M
  - Illinois Clean Water Initiative
  - Green Infrastructure for Clean Water





# Navigable Waterways

D-



- 1,118 miles of Inland Navigable Waterways in Illinois
- \$23B of goods (116 million tons) shipped annually
  - 4.4 million semi-trailer truck loads
  - 1.5 million rail cars
- 1 Gallon of fuel can move a ton:
  - 576 miles on a barge
  - 413 miles on rail
  - 155 miles on a truck
- Design life of 600 ft locks



Upper Mississippi Waterway System

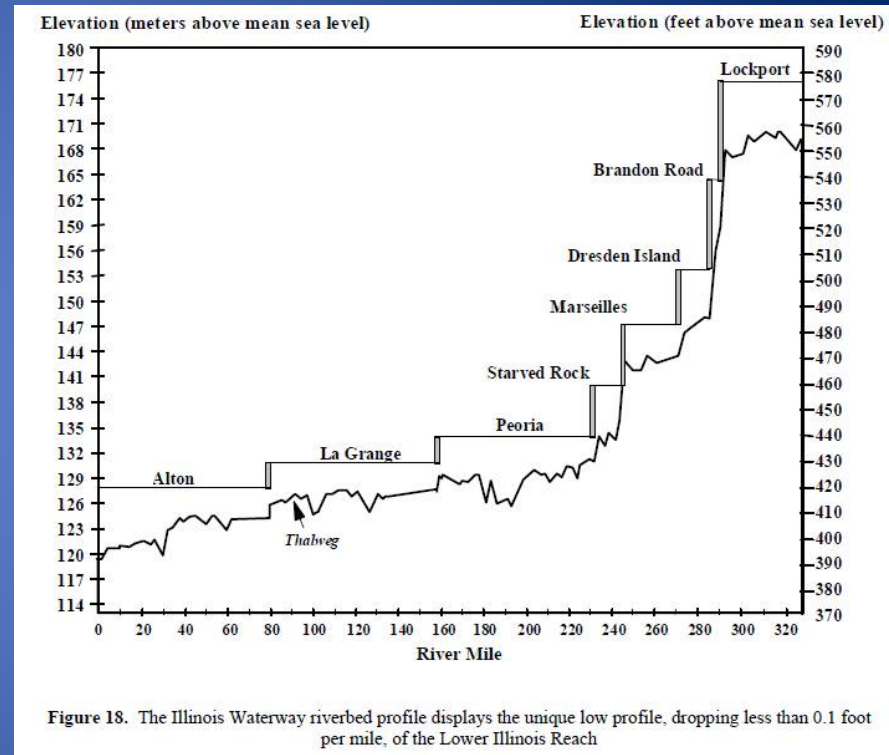
# Navigable Waterways

- Cost to transport one metric ton of soybeans
  - from Davenport, Iowa to Shanghai, China = \$85.19
  - from North Mato Grosso, Brazil to Shanghai = \$141.73
- Brazil port and waterway investment = \$26B
- US Funding:
  - Water Resources Development Act of 2007 (WRDA 2007) = \$2B
  - WRRDA recently passed Congress in 2014
  - Inland Waterways Trust Fund = \$84 Millions
- Hydrologic Separation of CAWS



# Navigable Waterways

- A series of Locks & Dams (L&D)
- Design Life of L&D = 50 Years
- All but 1 have exceeded Design Life
- 34 of 38 L&D in the Upper Miss River Basin are 600 ft
- Requires “double locking” for 1,200 ft tows



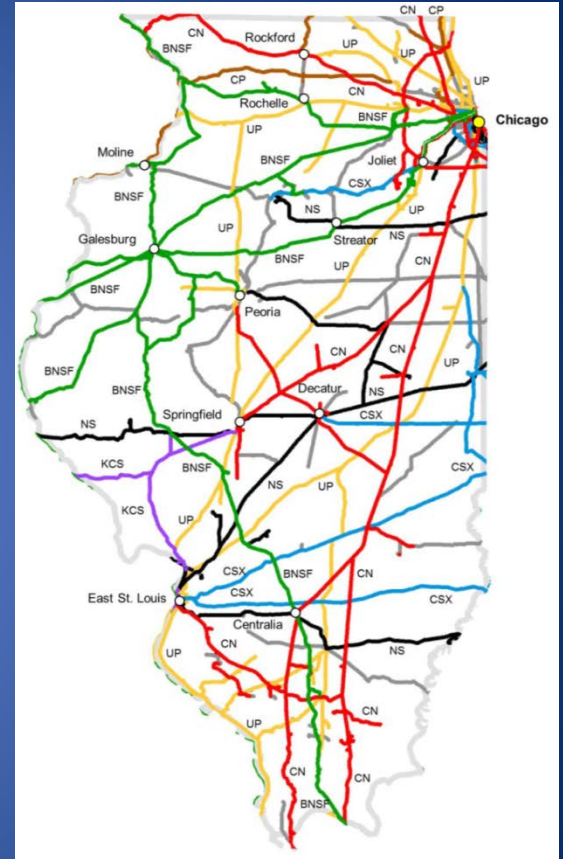
Illinois River Profile from Lockport to Alton, IL



# Rail



- The Illinois rail network - 2nd largest in the US
- Chicago - largest rail hub in US:
  - 500 freight trains with 37,500 cars per day
  - 700 passenger and commuter trains per day
- Rail freight volume is expected to double by 2025



True Story: A recent trainload of sulfur took some 27 hours to pass through Chicago — an average speed of 1.13 miles per hour, or about a quarter the pace of many electric wheelchairs!



# Rail

- Amtrak in 2013 – 6.4 million passengers in Ill.
  - 10<sup>th</sup> ridership record in 11 years
  - Ridership up 85% between 2006 and 2011.
- Recent Funding:
  - Class 1 Rail: \$3B
  - Federal: \$1.5B
  - State: \$800M
  - CREATE\*: \$500M
- Future Need = \$20B



Midwest Regional Rail Initiative

# Roads

D+



- From 1990-2012 in Illinois:
  - Travel on interstates increased 25%
  - Population increased by 13%
  - Lane miles increased by 11%
- Highway congestion in Chicago costs \$4B
- Chicago is 3<sup>rd</sup> most congested city in US



Chicago Circle Interchange – Looking West



# Roads

- Illinois' roadway system is ranked 36<sup>th</sup> in terms of best-to-worst roadway conditions in US
- 42 percent of Illinois' major roads are in poor or mediocre conditions.
  - costs Illinois motorists \$3.7B year in extra vehicle repairs and operating costs, or \$441 per motorist
- Transportation-related construction projects will decline by about \$2B by Fiscal Year 2018.
  - two-thirds decline in projects
  - impact about 20,000 jobs.



# Transit

D+



- Regional Transit Authority (RTA) serves Chicago Region
  - 3<sup>rd</sup> largest in US
  - 2<sup>nd</sup> oldest based on equipment in use
  - 2 million rides per weekday
  - Ridership up 5% from 2010
- Outside of the RTA region:
  - 9 additional urbanized mass transit districts
  - 3 municipal run transit systems
  - 30 million rides per year

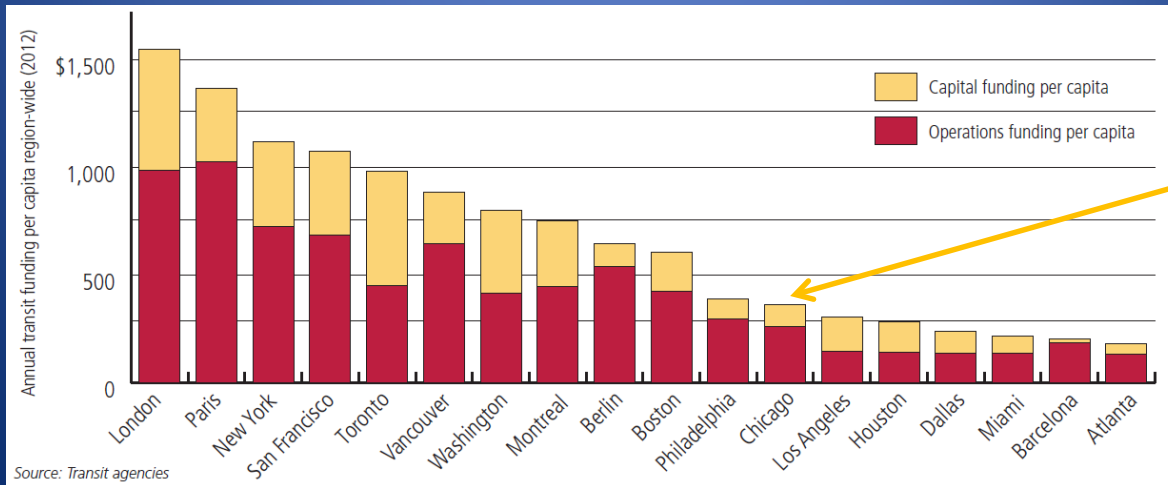


*Without Transit these would be drivers  
instead of riders!*



# Transit

- Funds needed to bring RTA into “state of good repair” over the next ten years rose to \$30.9 billion in 2012 from \$26.1 billion in 2010
- Transit investment is down 25% in last 20 years
- Projected 1975 - 2020:
  - Chicago has added about 20 miles to its light rail “L” system.
  - Dallas, Denver, Los Angeles, San Francisco and Washington will each add 90 miles of new rail transit lines



Chicago under-invests in Transit compared to other cities

Transit Funding per Capita

# Wastewater

D+



- Illinois Pop. = 12 million
- 1,000 collection systems
  - some > 100 years old
- 800 WWTPs
  - Range from <1MGD – 1.2 BGD
- 119,244 miles of rivers and streams
- 91,400 inland lakes and ponds



Stickney WWTP – 1.2 billion gal/day

# Wastewater

- In 1972:
  - % of stream miles assessed in good condition (aquatic life) = 34.7%
- In 2010:
  - % of stream miles in good conditions = 63.2%
- Illinois Wastewater need = \$17.5B over 20 years
  - Replace existing systems and keep up with demand
    - \$4.45B for secondary treatment
    - \$1.38B for sewer replacement and rehabilitation
    - \$650M for new collection sewer and interceptors
    - \$110M for inflow/infiltration correction
    - \$10.88B for combined sewer overflows

# Wastewater

- 2009 American Recovery and Reinvestment Act
  - Boosted Illinois Environmental Protection Agency's Clean Water State Revolving Fund (CWSRF)
  - Added \$177 M for wastewater projects in Illinois
  - Not enough to keep up with demand
- Funding Sources:
  - State Revolving Loan Fund
  - Clean Water Initiative

# What Can We Do?

- Create Long Term Sustainable Infrastructure Investment Programs
  - CREATE Rail Program
  - Building a New Chicago – Water Investments
  - Move Illinois Tollway Program
  - These Programs work – grades increase
  - Reliance on Federal funding will not work
  - Need a State Capital Bill
- Build Modern, Smart and Resilient Systems
  - Not just repair existing systems
  - Need to be built for 21<sup>st</sup> Century
  - Need to be able to withstand weather extremes and the human factor

# What Can We Do?

- Build Modern, Smart and Resilient Systems
  - Not just repair existing systems
  - Need to be built for 21<sup>st</sup> Century
  - Need to be able to withstand weather extremes and the human factor
- Invest in Infrastructure Systems that re-establish our economic competitive advantage
  - Navigable Waterways
  - Roads
  - Rail
  - Transit

# Did it Work?

CHICAGO

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## The Infrastructure in Illinois Is Not as Bad as You'd Think

Even in these austere times, the state's rail and roads are not a doomsday scenario. But Chicago, one of the country's major shipping hubs, faces an uncertain future. BY WHET MOSER

PUBLISHED THURSDAY AT 4:41 PM

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A view of the Metra Englewood Flyover (at left) under construction at 63rd Street between State Street and Wenworth Avenue in Chicago on Thursday, Aug 1, 2013. PHOTO: TERENCE ANTONIO JAMES/CHICAGO TRIBUNE

MARKETPLACE & CLASSIFIEDS

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So it's notable that the American Society of Civil Engineers' new Illinois Infrastructure Report Card, a vast amount of technical and funding data sifted down to a few letter grades as a political conversation starter, not only got better (D+ to C-), no single category (aviation, bridges, dams, drinking water, navigable water, rail,

5 NBCCHICAGO

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ANDREW KEASCHALL  
AMER. SOCIETY OF CIVIL ENGINEERS

2:50 / 3:29

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## Many Chicago Bridges Sorely in Need of Repair

There are estimates that the repair tab for bridges in Illinois would now run a whopping \$10 billion. NBC 5's Phil Rogers reports.



INFRASTRUCTURE REPORT  
ILLINOIS

- INFRASTRUCTURE: C-
- 2013: D+
- 42% OF ROADS POOR
- 16% OF BRIDGES DEFICIENT

23 HD



illinois  
INFRASTRUCTURE REPORT CARD

AVIATION	C+
BRIDGES	C+
DAMS	C
DRINKING WATER	D
NAVIGABLE WATER	C
RAIL	C
ROADS	D+
TRANSPORT	D+
WASTE WATER	D+

ILLINOIS INFRASTRUCTURE REPORT CARD  
OVERALL GRADE: C-



2014  
REPORT  
CARD

Illinois  
INFRASTRUCTURE

ASCE's *Report Card for Illinois Infrastructure* seeks to inform the public and policy makers about the condition of the state's infrastructure and how to improve it.

# Questions?

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Past-President

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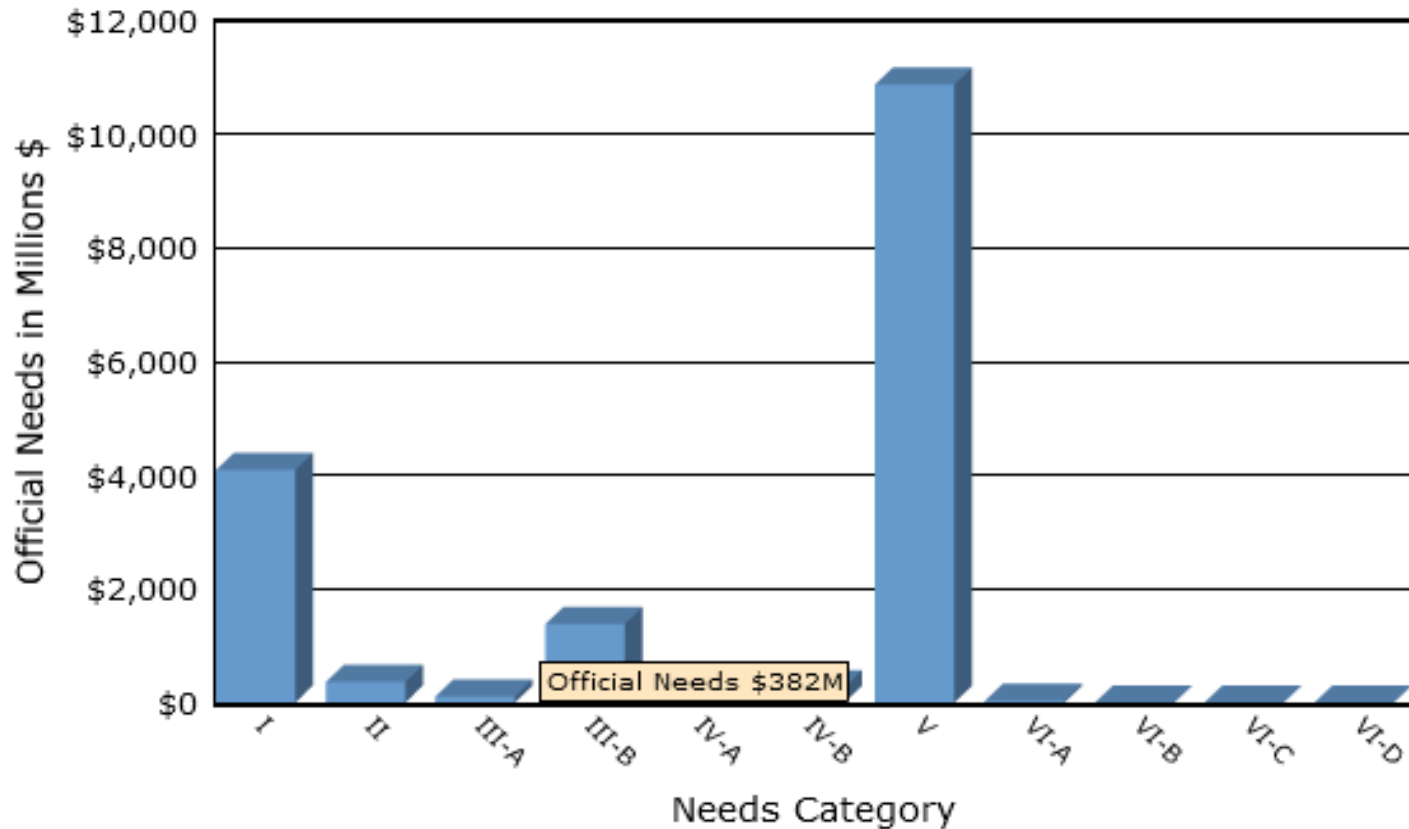
# Wastewater/Stormwater Needs

## CLEAN WATERSHED NEEDS BY CATEGORY

IN BILLIONS OF JANUARY 2008 DOLLARS	BILLIONSS	PERCENT OF TOTAL
SECONDARY WASTEWATER TREATMENT	59.9	20.1
ADVANCED WASTEWATER TREATMENT	45.3	15.2
INFILTRATION/INFLOW CORRECTION	8.2	2.7
REPLACEMENT/REHABILITATION OF SEWERS	33.7	11.3
NEW COLLECTOR SEWERS	21.4	7.2
NEW INTERCEPTOR SEWERS	19.4	6.5
CSO CORRECTION	63.6	21.3
STORM-WATER MANAGEMENT	42.3	14.2
RECYCLED WATER DISTRIBUTION	4.4	1.5
TOTAL	298.1	100

Source: Environmental Protection Agency, Clean Watersheds Needs Survey, 2008

# Wastewater/Stormwater Needs



# How About Compared to Other Nearby States?



National  
Grade = D+

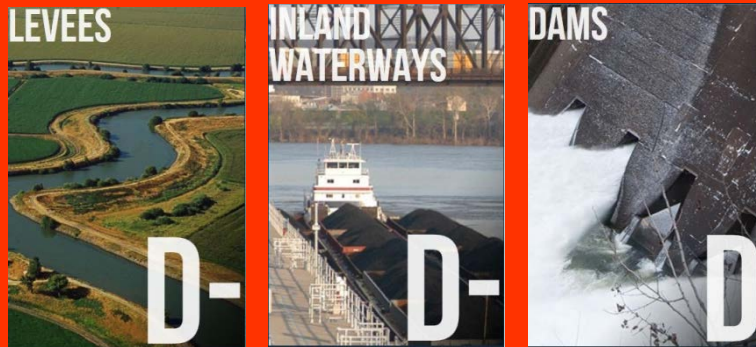
\*States without grades have not completed state-wide report card

# Current Issues

- Water Resources Reform & Development Act
- Federal Highway Trust Fund
- Funding
- What can we do?



# Water Resources Reform and Development Act Passed!



- \$12.3 billion WRRDA, authorizes 34 water resource projects across the U.S.
- The benefits from WRRDA are far reaching:
  - strengthens the National Levee Safety Initiative
  - reauthorizes the National Dam Safety Program
  - restores trust to the Harbor Maintenance Trust Fund
  - creates a new Water Infrastructure Finance Innovation program, and
  - streamlines the project approval process for water resources projects

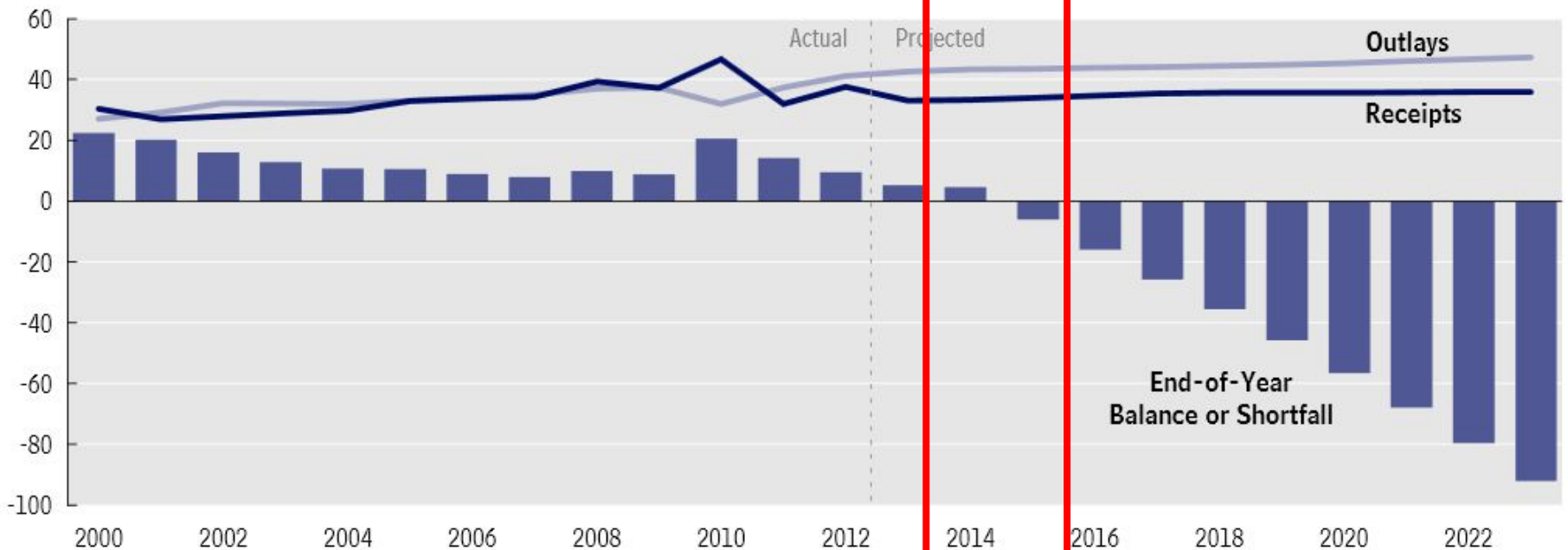


# Federal Highway Trust Fund

## Transportation Reauthorization and Highway Trust Fund Insolvency Looming this Fall

### Receipts, Outlays, and Balances of the Highway Trust Fund

(Billions of dollars)



Source: Congressional Budget Office.

Note: Estimates are based on CBO's February 2013 baseline projections.

# Funding

- Fix the Federal Highway Trust Fund
- Various proposals being looked at in Illinois to reform transportation funding
  - Redirect sales tax on gasoline to transportation (end the diversion of funds)
  - Adjust gas tax
  - Gas sales tax
  - Reprioritize other transportation and user fees
- ASCE supports an all options on the table approach