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

• STREAM VIDEO WILL BE AVAILABLE ON MWRD WEBSITE
  (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

**Professional**
- Certified floodplain manager (CFM)

As a Senior Civil Engineer for Hey and Associates.
Patrick Lach, P.E., CFM
Past-President
Illinois Section ASCE
www.isasce.org
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
Are We at Least Making Progress?

### 2010 Report Card for Illinois Infrastructure

Each category was evaluated on the basis of condition vs. need and funding vs. need.

<table>
<thead>
<tr>
<th>Category</th>
<th>Grade</th>
</tr>
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<tbody>
<tr>
<td>Aviation</td>
<td>C+</td>
</tr>
<tr>
<td>Bridges</td>
<td>C+</td>
</tr>
<tr>
<td>Dams</td>
<td>C</td>
</tr>
<tr>
<td>Drinking Water</td>
<td>D+</td>
</tr>
<tr>
<td>Navigable Waterways</td>
<td>D-</td>
</tr>
<tr>
<td>Rail</td>
<td>D</td>
</tr>
<tr>
<td>Roads</td>
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<tr>
<td>Transit</td>
<td>D+</td>
</tr>
<tr>
<td>Wastewater</td>
<td>D+</td>
</tr>
</tbody>
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**2010 Grade:** D+

### 2014 Report Card for Illinois Infrastructure

Based on 8 criteria (capacity, condition, funding, future need, operation and maintenance, public safety, resilience and innovation).

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**2014 Grade:** C-

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ASCE Illinois Section
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

- 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

- Illinois Bridges = 26,514 (3rd most in nation)
- Structurally Deficient = 8.7%
- Functionally Obsolete = 7.5%
- National Condition Ranking = 6th lowest
• Decreasing Funding Leads to Larger Backlog!
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
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

- 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:
  – 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
• 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.
  - 10th 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

*Chicago Regional Environmental and Transportation Efficiency Program
• 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 3rd most congested city in US

Chicago Circle Interchange – Looking West
Roads

• Illinois’ roadway system is ranked 36th 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

• Regional Transit Authority (RTA) serves Chicago Region
  – 3rd largest in US
  – 2nd 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.

Transit Funding per Capita

Chicago under-invests in Transit compared to other cities
Wastewater

- 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 21st 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\textsuperscript{st} 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?

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 WREET HOSIER

The Infrastrucure 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-), it adds extreme flooding, brackish, dirty drinking water, vibratory water, rail.

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.
Questions?

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Past-President
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# Wastewater/Stormwater Needs

## Clean Watershed Needs by Category

<table>
<thead>
<tr>
<th>Category</th>
<th>Billions of 2008 Dollars</th>
<th>Percent of Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Secondary Wastewater Treatment</td>
<td>59.9</td>
<td>20.1</td>
</tr>
<tr>
<td>Advanced Wastewater Treatment</td>
<td>45.3</td>
<td>15.2</td>
</tr>
<tr>
<td>Infiltration/Inflow Correction</td>
<td>8.2</td>
<td>2.7</td>
</tr>
<tr>
<td>Replacement/Rehabilitation of Sewers</td>
<td>33.7</td>
<td>11.3</td>
</tr>
<tr>
<td>New Collector Sewers</td>
<td>21.4</td>
<td>7.2</td>
</tr>
<tr>
<td>New Interceptor Sewers</td>
<td>19.4</td>
<td>6.5</td>
</tr>
<tr>
<td>CSO Correction</td>
<td>63.6</td>
<td>21.3</td>
</tr>
<tr>
<td>Storm-Water Management</td>
<td>42.3</td>
<td>14.2</td>
</tr>
<tr>
<td>Recycled Water Distribution</td>
<td>4.4</td>
<td>1.5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>298.1</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

Wastewater/Stormwater Needs

![Bar chart showing official needs in millions of dollars by needs category. The chart indicates a significant need category labeled V with an official need of $382M. Other categories have much lower requirements.]
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

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