Strategic Water Management in Indiana

Jack Wittman, Ph.D.
August, 2018
Topics

• Infrastructure and Funding
• Recent Policy
• Planning
WHY SHOULD WE CARE ABOUT WATER INFRASTRUCTURE?
WATER UTILITIES: THE MOST EFFECTIVE PUBLIC HEALTH INVESTMENT EVER
History of Water and Public Health

- Pre 1770 – outhouse and wells
- 1770 – invention of water closets
- 1860 – connection to city sewers
- 1880 – widespread river contamination
- 1910 – development of sand filters
- 1920 – use of chlorine as disinfectant
- 1921 – outlaw privies in Indianapolis
- 1930 – new treatment plants constructed
- 1940 – public health institutions
Death Rates Fall with Treatment

Crude Death Rate for infectious diseases – United States 1900-1996

- Influenza Pandemic
- Last Human to Human transmission of Plague
- First continuous use of chlorine in drinking water in US
- Penicillin introduced
- Salk Vaccine introduced
- Vaccination Assistance Act
Death Rates Fall with Treatment

Water Treatment and Distribution

Responsible for:
- 50% of reduction in mortality
- 75% of reduction in infant mortality
- 65% of child mortality

Crude Death Rate for infectious diseases – United States 1900-1996

Infrastructure is Public Health
Infrastructure – National / State Picture

• Federal Funds
  – Omnibus Bill -> WIFIA

• State Role
  – WIFIA -> Indiana Finance Authority -> utilities

• Estimated Funding Need
  – $2.3 B now + $800 M/year for 20 years

• Current Status
  – limited resource knowledge but new statute (Water Task Force)
### Annual Federal Investment

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Federal Contribution (1977 - 2014)

Graph showing the federal contribution to various infrastructure sectors (water utilities, highways, aviation, and all transportation infrastructure) from 1977 to 2014. The graph indicates a trend of decreasing federal contribution over time, with water showing a particularly significant decline.
State and Local Construction Spending

State and Local Government Construction
Water supply Spending Annual Rate

Note: Spending totals represent the value of U.S. construction put in place, not when costs are incurred. Source: U.S. Census Bureau, seasonally adjusted data. Inflation adjustments calculated using CPI-U.
CRITICAL TO THE FUTURE

- FEW FEDERAL DOLLARS

- LESS STATE SUPPORT

INDIANA NEEDS EFFECTIVE POLICY
Data-Driven Policy

2015
Evaluation of Water Utility Planning in Indiana
A survey of best practices, challenges, and needs
October 2015

2016
Evaluation of Indiana’s Water Utilities
An analysis of the State’s aging infrastructure
November 2016

2017
Southeastern Indiana Regional Water Supply
Feasibility and cost analysis
January 2018
Key Insights

FINDINGS
How is need distributed across the state?

$2.3 \text{ Billion} \text{ initial cost} \quad \$815 \text{ Million/yr} \text{ for 20 years}
Consensus of Utilities Surveyed

- Would like State to structure regional planning
- Water quality is a serious constraint on availability
- Not sure who is in charge
- None able to replace water mains in less than 100 years
- Regional cooperation among all users should add resilience to supplies and more efficient service
Should the Infrastructure Problem be Solved by Future Generations?

- The surveyed utilities felt that, while infrastructure needed to be replaced, the rate payers were not willing to pay more. They said they had no choice but to leave this problem to future generations.

- Recent laws address the needs described by all water utilities across the state.
Regional Planning

• Why
• How
• Initiation
Why plan?

**Economics and quality of life**

- Economic Development depends on a reliable supply of water and Indiana depends more than any other state on abundant supplies (Rosaen, 2014).

- Quality of life is enhanced by a healthy environment. This is a multi-million dollar asset that deserves protection.
Why plan?

We are competing with every country in the world for business.

If Indiana wants to add manufacturing, increase agricultural productivity and be an attractive place to live, we need to know our priority basins and our priority uses of water.

Our water stretches across state boundaries.

Communities in NW Ohio are considering tapping an aquifer that stretches into SW Michigan and NE Indiana.
Why plan?

To be prepared for drought.

Climate change patterns suggest that groundwater is less available than in the past. We need to be ready to manage the roller coaster of variation that affects our options.
Where do we use water?

- Cities
- Power Plants
- Industrial facilities
- Agriculture/Irrigation
TRENDS
1987-2013

Power plants and mining
Self-supplied industrial
Agricultural Irrigation
Public supplies
Changes in Irrigation Water Use: 1985 - 2010

Source: USGS historical irrigation water withdrawals for the U.S.
INDIANA

TOTAL 2013 WATER USE
Size proportional to use
SEASONAL (Summer)
GROUNDWATER USE

- Energy
- Industry
- PWS
- Ag
Population Change

- Populations changing
- Power shifting
- Industrial needs less
- Agricultural irrigation
These questions need answers

- How much water will we need?
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• How much surface and groundwater is available?
  – Do we need more data about the streams and aquifers?
• How is groundwater connected to surface water?
• What are the supply options given expected demand?
Regional Planning Needs to Begin

Proposed Water Supply Planning Regions in Indiana

Potential Pilot Basin
Thank You

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