



2017 ASCE Report Card Fraught with Errors

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The 2017 Infrastructure Report Card was recently released by the American Society of Civil Engineers ([ASCE](#)) and a cursory review leaves me to wonder, who is editing this thing? Is anyone looking critically at making sure investment recommendations are worthwhile and in the public interest? Much of our nation's infrastructure was built during the 1930s New Deal as part of a grand vision to build dams, roads and

bridges. While those federal investments are credited at least with bringing the nation out of the Depression, some of those investments have caused unacceptable environmental damages, like the dams that block migrating salmon. Infrastructure today needs a new vision that focuses on building a more sustainable future, like high speed rail, functional mass transit and renewable energy. Unfortunately, the ASCE is stuck in the 20th century as it evaluates the nation's infrastructure.

The American Society of Civil Engineers (ASCE) [states on their website](#) that:

ASCE and its members are dedicated to ensuring a sustainable future in which human society has the capacity and opportunity to maintain and improve its quality of life indefinitely, without degrading the quantity, quality or the availability of natural, economic and social resources.

Obviously, the statement is a legitimate and encompasses many of the basic components of sustainability. However, as many growth-oriented organizations ignore, there is no consideration of what specific physical and biologic needs and how much of them are essential to "maintain and improve its quality of life indefinitely."

The ASCE uses its Report Card to quantify how much it would cost to repair existing system or expand them, but there is no questioning of whether all of the existing infrastructure systems are actually providing public value or even have the potential of being sustainable. The overarching philosophy is to maintain these systems without looking beyond them to fundamental changes in how the systems work or don't work in providing their intended benefit, which is not corporate profits.

This is especially true of the Inland Waterways System (IWS), which is the most subsidized commodity transport system in the U.S. and a system that has highly damaged one of the most diverse, productive and rare habitats that exists – rivers and floodplains.

There is a fundamental problem with this ASCE Report Card regarding the IWS, which is strongly based on the U.S. Army Corps of Engineers (Corps) Inland and Intracoastal Twenty-Year Capital Investment Strategy report.¹ The Corps report is an industry Christmas wish list to taxpayers. There is no analysis whatsoever of whether these segments, that were built long before we understood the value of healthy

¹ Inland and Intracoastal Waterways Twenty-Year Capital Investment Strategy, USACE, March 2016

river ecosystems, are actually worth the expense of maintaining and upgrading them. It is taken as gospel that the inland waterway system in its entirety has been a worthwhile investment and should continue with no evaluation or change – other than expanding it.

But we have much evidence that this is a flawed approach and we desperately need to do thorough reviews of the inland waterway infrastructure to ensure limited taxpayer dollars are being invested in projects that are truly in the public interest. This is especially true on the Inland Waterways System where the cost of the infrastructure is subsidized by a whopping more than 90%.² Another concerning point is that the ASCE Report Card contains many typos and contradictory information. Figures and images frequently contradict text on the same page.

With such sloppy work, how can the report card be taken seriously? Unfortunately, the document is oft cited by Congress and other elected officials to get support for expensive infrastructure investment packages. The public needs to push for a new “New Deal” - a new vision for America’s future that’s not based on cement and fossil fuel.

“If we build it, they will come” – Justifications for Infrastructure Investments are Flawed

Much of the inland waterway system was built on promises that river traffic would reach certain levels to justify the expense, but that has rarely panned out. A good example of this is on the Missouri River. The Corps’ projection of five million tons of commercial barge traffic annually on the Missouri River was significantly incorrect. The highest volume level reached was 3.34 million tons in 1977 with a steady decline ever since and it currently carries about 200 thousand tons annually.

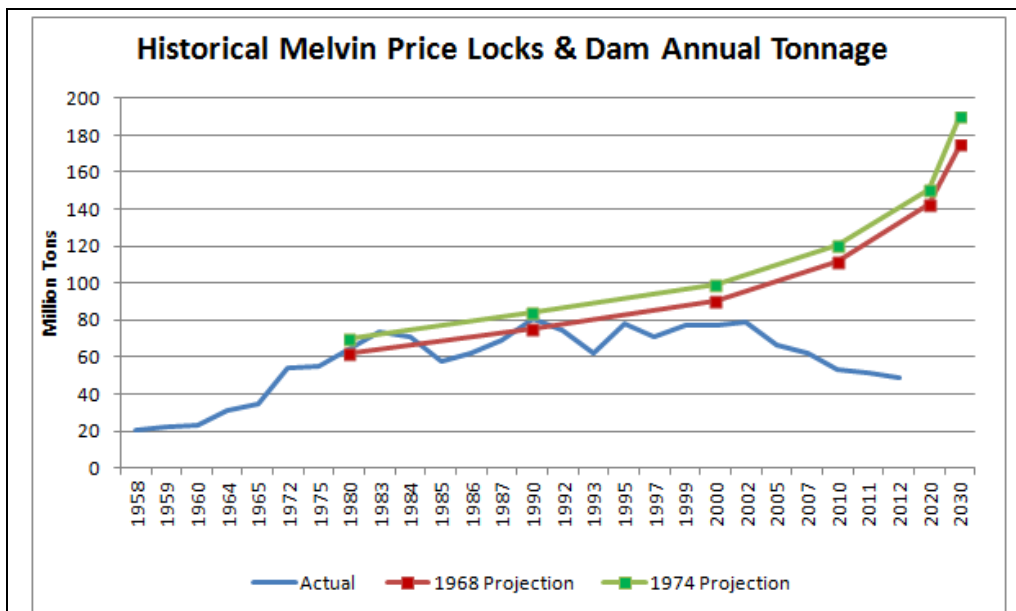


Figure 1: Historical Melvin Price Locks & Dam Annual Tonnage

Data Sources: USACE Barge Volume Reports for Locks & Dam 26 and Melvin Price Locks & Dam and Locks & Dam 26 R project proposals

Similarly, in 1974, the Corps’ traffic projection to justify the \$1 billion Melvin Price Locks & Dam estimated that by 2010 120 million tons would flow through the two locks. The reality was that less than

² Congressional Budget Office Report on infrastructure: <https://www.cbo.gov/sites/default/files/102nd-congress-1991-1992/reports/1992-transportation.pdf>

60 million tons went through Melvin Price in 2010, which is less than half of what was expected. The projection actually continues to 2030 when 190 million tons were expected to go through the locks, based apparently upon the Melvin Price Locks & Dam's estimated capacity using the proposed two 1,200-foot locks (only one 1,200-foot lock and one 600-foot lock were actually constructed providing about 150 million tons capacity). From a retrospective view, this is impossible since the upstream locks on the UMR and the Illinois River have a capacity of about 50 million tons each for a cumulative capacity of about 100 million tons, which coincided with the year 2000 estimated volume in the Corps 1974 projection. The only way this can occur is if the upstream 600-foot locks are expanded to 1,200-foot locks, which was found not to be in the public interest. For those who follow river politics, this provides a unique window into the Corps long-term plans for the UMR as it is apparent the Corps was anticipating the UMR lock expansion as early as the late 1960s. Unfortunately for the Corps, despite the additional room to accommodate 100 million tons, actual traffic has declined.

After the construction of the Melvin Price Locks & Dam the Corps became somewhat more reasonable regarding barge volume projections when preparing its justification for the UMR system lock expansion project typically known as the Navigation & Ecosystem Sustainability Program (NESP). However, this was not without some truly negative national publicity in [2000](#) and subsequent high level prodding by the Assistant Secretary of the Army - Civil Works, requiring the drafting of the reevaluation of the NESP economics analysis.³ Within the report the Corps provided three UMR system barge traffic forecast scenarios attempting to justify the construction of seven new 1,200-foot locks upstream of the Melvin Price Locks and Dam. For each scenario the Corps calculated a Benefit-Cost ratio (BCR):

1. High Traffic Scenario (HTS): 1.3 to 1.0 BCR
2. Low Traffic Scenario (LTS): 0.4 to 1.0 BCR
3. Flat or Falling Traffic Scenario: 0.2 to 1.0 BCR

Because barge traffic has continued to be low, consistent with the Melvin Price history, the Flat or Falling scenario reflects reality and does not justify new locks. Even the HTS does not justify the expenditure of at least \$2 billion for the new locks with a barely positive BCR, given the Corps' history of overestimating benefits and underestimating the cost of lock projects.

The primary and authorized benefit of the IWS is to provide a cost savings to the public (not simply the users) for using the segment of the IWS for shipping by barge rather than using other modes such as rail or truck. This is not discussed in either the Report Card or the Corps report, at least in part, because fair comparison would also require taking into account the massive public subsidies that [only the IWS receives](#).

Inland Waterways Trust Fund Information is Incomplete

The first paragraph on the third page discusses the Inland Waterways Trust Fund (IWTF), specifically the nine-cent increase of the fuel tax to 29 cents in 2015. Yet the Report Card does not mention that the 29 cents per gallon tax is still inadequate.⁴ The ASCE also neglects to discuss the fact that industry does not contribute to the operation and maintenance of the system, which is totally the obligation of the tax payers.

³ Final Re-evaluation of the Recommended Plan : UMR-IWW System Navigation Study – Interim Report, USACE, March 2008

⁴ According to the industry report: Inland Marine Transportation System Capital Projects Business Model (page 68) available at http://www.iwr.usace.army.mil/Portals/70/docs/Wood_doc/IMTS_Final_Report_13_April_2010_Rev_1.pdf

Although the Inland Waterways Users Board was pushing for the fuel tax increase, the effort was primarily motivated to circumvent the possible imposition of a lockage fee, which had been proposed by several U.S. presidents; the most recent being the Obama Administration, and intended to address the inadequacy of the fuel tax. The barge industry strongly opposes lockage fees, although the fees would be fairer because it would be collected more directly from those using the locks.

There is also no discussion of the Olmsted Locks and Dam project cost overrun and the concurrent reduction of the IWTF obligation for the required 50% cost share of the project to just 15%, which shifted \$500 million dollars of industry future cost obligations directly to the taxpayers.

The actual history of the IWTF flies in the face of the trust fund discussion in the Report Card's Solutions: Investments section in which there is no mention of the IWTF and its issues:

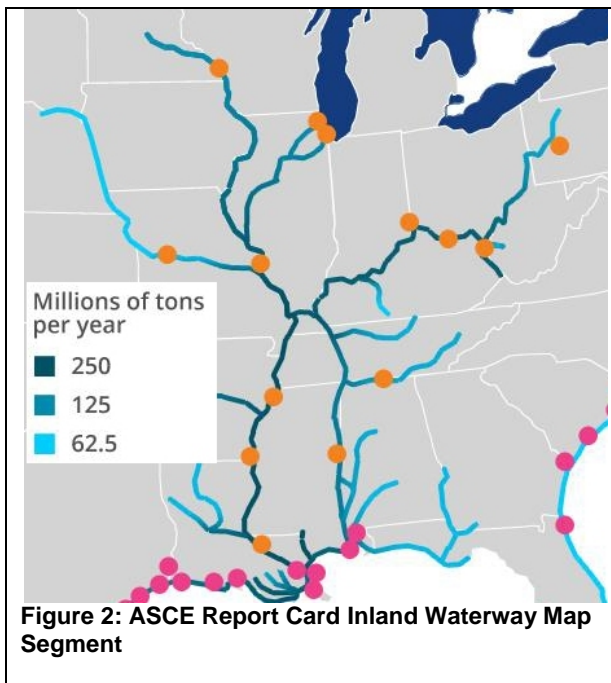
1. Put the "trust" back into "trust funds." Dedicated public funding sources on the local, state, and federal levels need to be consistently and sufficiently funded from user-generated fees, with infrastructure trust funds never used to pay for or offset other parts of a budget."

Also, solution four is certainly ironic from a taxpayer perspective regarding the IWS:

4. Infrastructure owners and operators must charge, and Americans must be willing to pay, rates and fees that reflect the true cost of using, maintaining, and improving all infrastructure, including our water, waste, transportation, and energy services.

It is interesting that the ASCE Report Card praises the rail industry for essentially being self-supporting of their system, yet ignores the need for more contribution by the barge industry for its system. The rail industry infuses almost as much funding into its system each year than the barge industry has contributed in its entire history.

Erroneous and misleading information



There are several apparent errors of varying extent within the Report Card.

1. Erroneous traffic figures

The Inland Waterways traffic map (Figure 2) is nearly completely wrong. The Missouri River upstream of Kansas City is identified as carrying 62.5 million and downstream of Kansas City 125 million tons. As was pointed out earlier, barge traffic does not even break half a million tons.

The Mississippi north of St. Louis and the Illinois River are shown as having 125 million to 250 million tons, which as pointed out above, is grossly over stated. These river segments move about 50-100 million tons in total. South of St. Louis to the confluence of the Ohio River, which typically moves between 100 and 150 million tons per year is shown as 250 million tons.⁵

⁵ Waterborne Commerce – Waterways, Harbors, Gulf Coast, Mississippi River System, USACE, 2014, page 199

Although there is no indication in the maps legend, it could be the ASCE is attempting to show ranges, e.g. 0 to 62 million tons and 62 to 125 million tons, but it is certainly not clear. Aside from being a very inaccurate way of showing relative volumes on rivers/segments that vary considerably, this methodology is extremely misleading and inaccurate. The map also has no source citation.

2. Barge and Rail volume typos

The Inland Waterways System section of the Report Card has different annual total volumes for barges: “more than 600 million tons” and “more than 575 million tons.” [Rail hauls about three times the IWS amount](#) but in the Railroad section of the Report Card it lists the rail system as “delivering 5 million tons”, which is obviously incorrect. The Report Card also states that rail carries one-third of U.S. exports, which we find questionable, but would believe one-third of all domestic freight.

3. River mile typos

In the first paragraph, the Report Card indicates that the IWS encompasses 25,000 miles, yet it actually has only 12,000 miles, the Intracoastal portion has the rest of those miles and would more likely be related to the section on Ports.⁶

4. Ignoring rehabilitation

The first paragraph of page 2 of the Inland Waterways System Report Card section calls the system “aging and unreliable” and continues this assessment by stating that “the majority of locks and dams on the system are well beyond their fifty-year design life” implying that they need to be replaced. Nowhere in the Report Card is there any mention that all of the locks on the UMR and Illinois River have had major rehabilitation projects and that, like cars and any other kinds of capital, with proper maintenance and rehabilitation the locks can perform indefinitely.⁷ Associated with this omission is any discussion about the backlog of maintenance and the lack of contribution by the industry to the maintenance costs of the system that they depend upon.⁸

5. Fuel Efficiency Myths

In the last paragraph of page one the Inland Waterways System Report Card repeats the myth of barge fuel efficiency and only mentions trucks in comparison. However, it should be common knowledge by now that rail, especially within the UMR above St. Louis and within the Illinois River that rail is more fuel efficient than barges, especially unit trains, which are greater or comparable in fuel efficiency in all other segments.⁹

6. Omits Job Figures

In the first page the Inland Waterways System Report Card touts the value of commodities shipped and the jobs supported by the IWS. Yet it completely leaves out a comparison of those numbers regarding rail, which would dwarf the barge-related numbers.

7. Averages Hide Problem Areas

⁶ Inland and Intracoastal Waterways Twenty-Year Capital Investment Strategy, USACE, March 2016, page 2

⁷ U.S. Army Corps of Engineers, 2004, “Final Integrated Feasibility Report and Programmatic Environmental Impact Statement for the UMR-IWW System Navigation Feasibility Study,” page 85

⁸ For information on the IWS subsidies and funding see <http://moenvironment.org/environment-blog/2016/02/01/the-wci-doth-protest-too-much-methinks/>

⁹ For more information about barge and train fuel efficiency see <http://www.nicolletislandcoalition.org/issues/environment/fuel-efficiency/>

On the second page Inland Waterways System section, there is a discussion on delays at locks, but ASCE only provides an overall system average, which is misleading because a particularly bad segment can skew an average and make the whole system appear worse than it really is. Instead of talking about a national average, ASCE needs to provide information by river segment. This section of the report card also talks about concerns with “increasing traffic” given the existing delays, but provides no evidence that traffic will increase and certainly no evidence that any increases will be seen in those areas with extensive delays.

Conclusions

Congress needs to establish a legitimate and functional review system of all existing projects, as was recommended in the 2012 National Academy of Science report [Corps of Engineers Water Resources Infrastructure: Deterioration, Investment, or Divestment?](#) We seem to make no organized effort to learn lessons from the construction of past bad projects, thus compelling us to repeat mistakes in our rivers - an oft repeated human foible.

Finally, the ASCE is an organization representing civil engineers whose members primarily make their living from designing, constructing and managing projects. While I understand that they consider themselves ethical and truly concerned about the nation, they cannot be considered unbiased regarding the needs for our public infrastructure. They want more projects; it matters not whether the projects are necessarily bad or good, justified or needed, nor in the public's best interest - their members will still make money from building them. We do wish they would incorporate a more considered approach that does not assume that what exists must stay or be expanded. There is a lot of our existing infrastructure, even systems, which need an objective evaluation from both an ecologically and financially sustainable perspective.

In addition to correcting all of the above points, ASCE recommendations should explore additional relevant problems with the IWS:

1. Require the barge industry to pay at least half of the Operation & Maintenance costs of the system, including those required for dams. Industry should also be contributing to the costs of ecosystem restoration since it is their system that has caused the majority of the environmental damage to the river and its floodplains.
2. The barge industry's fuel tax contribution must be increased to at least \$.50 per gallon, or lockage fees must be instituted at all locks to cover the added costs in Item 1 above.
3. Require that projects have a benefit-cost ratio of at least 2.0 to 1.0 because of the history of cost overruns for locks and dams , before being authorized in order to eliminate projects that do not benefit the public.
4. Require small-scale and non-structural measures be instituted to solve inland waterway infrastructure challenges before large-scale measures like new locks and dams are constructed.
5. Consistent funding is needed but Water Resources Development Acts do not “appropriate” funding, they only authorize projects. However, because there are too many unjustified projects authorized by Congress, it needs to fully and straightforwardly engage the de-authorization requirements they have enacted to remove the numerous unnecessary projects. This would help keep the appropriation process from diluting funding to legitimate projects.

<http://www.nicolletislandcoalition.org/2017/05/22/2017-civil-engineers-report-card-fraught-with-errors/>